NOTICE

All drawings located at the end of the document.

RLCR-ES-RF-CEC/2, Dec-001-03

Rocky Flats Environmental Technology Site

RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR)

AREA 2, GROUP 2 CLOSURE PROJECT

991, 991 Tunnels, 985, 996, 997, 998 & 999

REVISION 1

January 14, 2003

CLASSIFICATION REVIEW NOT REQUIRED PER EXEMPTION NUMBER CEX-005-02

1/244

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REVISION 1

January 14, 2003

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2

TABLE OF CONTENTS

ATTACHMENTS

3

ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
IHIS	Industrial Hygiene Information System
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and compliant disposition and waste management of Area 2, Group 2 facilities (i.e., Buildings 991, 991 Tunnels, 985, 996, 997, 998 & 999). Because these facilities were "anticipated" to be Type 2 facilities, the characterization was performed in accordance with the Reconnaissance Level Characterization Plan (MAN-077-DDCP). All facility surfaces were characterized in this RLC, including the interior and exterior surfaces [i.e., floors (slabs), walls, ceilings and roofs]. Inaccessible floor areas (due to waste storage) will be characterized during in-process characterization and/or the Pre-Demolition Survey. Environmental media beneath and surrounding the facilities were not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

The RLC encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

Buildings 991, 996, 997, 998 and 999 were final assembly areas for plutonium, enriched uranium, depleted uranium, and beryllium weapons components. These components were stored in the 991 Cluster prior to off-site shipment. Final assembly operations were terminated in 1958, and moved to Building 777. At the time the RLC was conducted, the 991 Cluster warehoused beryllium and radiologically contaminated drum waste, with the exception of Building 985, which is the HEPA filter plenum building that assists in keeping the 991 Tunnel and vaults under continuous negative air pressure.

A comprehensive asbestos inspection was performed in order to determine non-friable and friable asbestos containing building materials. Both friable and non-friable asbestos containing materials were identified such as: thermal systems insulation, 12" x 12" vinyl floor tiles, 9" x 9" vinyl floor tiles, acoustical drop ceiling tiles, interior and exterior transite wall panels, transite base cove, drywall, black roofing tar and silver paint.

Historical and newly acquired RLC results indicated that radiological contamination does exist in excess of the RLCP prescribed release limits within the Building 991 paint near the entrance to the 991 west tunnel. Radiological contamination was not found in any other accessible area of the 991 Cluster, including the ventilation ducting in the 991 tunnels and vaults. Based on holdup measurements taken in the 991 Cluster, no known holdup exists in the 991 Cluster.

Beryllium contamination exists in excess of the RLCP prescribed release limits within the B991 basement utility tunnel and inside portions of the B991 ventilation system (e.g., building side of the HEPA filter bank). Beryllium contamination was not found in any other accessible area of the 991 Cluster, including the ventilation ducting in the 991 tunnels and vaults.

5

Any PCB light ballast, asbestos containing materials, and hazardous-waste items will be managed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations.

Based upon the elevated radiological and beryllium data presented in this RLCR, Building 991 is considered to be Type 2 facility. Based upon the data presented in this RLCR for Buildings 985, 996, 997, 998, 999, and the 991 Tunnels (i.e., no elevated radiological, beryllium or chemical contamination), these Buildings are considered to be Type 1 facilities. These classifications are based on the contaminants identified and the relative complexity associated with decommissioning the facilities. Decontamination, dismantlement and demolition will be accomplished using industry standard techniques, and will not require unique or non-standard techniques. The asbestos and physical hazards are not significant or overly intermingled and can be controlled through industry standard decontamination and decommissioning means.

The PDS surveys of exterior surfaces did not find any contamination above the transuranic DCGLs; therefore, all exterior facility surfaces meet the PDSP radiological release criteria. No additional exterior PDS radiological surveys are required except if a contamination event were to occur during decommissioning activities. Follow up action to a contamination event will require a verification survey prior to building demolition to ensure that PDSP release limits are met. Additionally, a confirmation smear survey shall be performed of the exterior surfaces prior to demolition. Areas that were inaccessible during this RLC (due to waste storage) will be characterized during in-process and/or PDS characterization. Since the RLC of the interior facility surfaces was performed utilizing the RLCP, an additional PDS will be required for the interior facility surfaces of the Area 2, Group 2 facilities (i.e., Buildings 991, 991 Tunnels, 985, 996, 997, 998 & 999) prior to demolition utilizing the PDSP.

1 INTRODUCTION

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and compliant disposition and waste management of the Area 2, Group 2 facilities (i.e., Buildings 991, 991 Tunnels, 985, 996, 997, 998 & 999). Because these facilities were "anticipated" to be Type 2 facilities, the characterization was performed in accordance with the Reconnaissance Level Characterization Plan (MAN-077-DDCP). All accessible facility surfaces were characterized in this RLC, including the interior and exterior surfaces of the facilities (i.e., floors (slabs), walls, ceilings and roofs). Inaccessible floor areas (due to waste storage) will be characterized during in-process characterization and/or the Pre-Demolition Survey. Environmental media beneath and surrounding the facilities were not within the scope of this RLC Report (RLCR) and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these are the Area 2, Group 2 facilities. The locations of these facilities are shown in Attachment A, Facility Location Map. These facilities will soon no longer support the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before the Area 2, Group 2 facilities can be decommissioned, a Reconnaissance Level Characterization (RLC) must be conducted; this document presents the RLC results. The RLC was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Reconnaissance Level Characterization Plan (RLCP) (MAN-077-DDCP). The RLC built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. RLCs are performed before building decommissioning to define the radiological and chemical conditions of a facility. RLC conditions are compared with the release limits for radiological and non-radiological contaminants. RLC results will enable project personnel to make decommissioning decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the radiological, chemical and physical conditions of the Area 2, Group 2 facilities. Environmental media beneath and surrounding the facilities are not within the scope of this RLCR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA. Both facilities and environmental media will be dispositioned pursuant to RFCA.

1.3 Data Quality Objectives

For the facility interior surfaces, the Data Quality Objectives (DQOs) used in designing this RLC were the same DQOs identified in the Reconnaissance Level Characterization Plan (RLCP) (MAN-077-DDCP). Refer to Appendix D, Section 2.0 of MAN-077-DDCP for these DQOs. For the facility exterior surfaces, DQOs used in designing the exterior PDS were the same DQOs identified in the *Pre-Demolition Survey Plan for D&D Facilities* (MAN-127-PDSP). Refer to Section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

Facility-specific Historical Site Assessments (HSAs) were conducted to understand facility histories and related hazards. The assessments consisted of facility walkdowns, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). Results were used to identify data gaps and needs, and to develop radiological and chemical characterization packages. Results of the facility-specific HSAs were documented in the Historical Site Assessment Report (HSAR) for the 991 Cluster (refer to Attachment B). In summary, the HSAR identified the potential for radiological and chemical hazards, including the potential for asbestos containing materials, beryllium, and PCBs in paint and light ballasts.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

The Area 2, Group 2 facilities were characterized for radiological hazards per the RLCP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files for the Area 2, Group 2 Radiological Characterization Plan). Radiological survey area packages were developed for each interior survey area (A–F). The exteriors of Buildings 991 and 985 were surveyed to meet PDS requirements, and therefore, two radiological survey packages were developed (991-B-009 for the B991 exterior, and 991-B-010 for the B985 exterior). Individual radiological survey area and unit packages are maintained in the RISS Characterization Project files.

Area 2, Group 2 survey area and survey unit packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*. Radiological survey data, soil sample data, media data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachments C1 – C10, Radiological Data Summary and Survey Maps.

- A total of 535 Total Surface Activity (TSA) measurements, 535 Removable Surface Activity (RSA) measurements, and 60 media (paint) samples were taken from the interior surfaces (refer to Survey Areas A-F, in Attachments C1-C6). Some TSA measurements indicated slightly elevated activity above the transuranic $DCGL_W$ values, however due to very high background count rates, these are considered to be naturally occurring radon daughter products as discussed below. None of the RSA measurements indicated elevated activity above the transuranic DCGL values.
- Two of the media (paint) samples from the drain trench, locations 44 and 50, indicated elevated activity above the transuranic and/or uranium DCGL values. These sample locations were bounded by samples 46, 47, 48, 49, and 51that were each less than the transuranic and uranium DCGL values. The elevated media (paint) samples were in a small, localized area in the northwest corner of Building 991, just outside the double doors leading into the west storage vault tunnel. Note: the start of the west storage vault tunnel is defined as the area northwest of the reinforced security double-doors in Corridor B; the area southeast of the reinforced security double-doors in Corridor B is considered part of the 991 building. All other media (paint) samples locations were less that the transuranic and uranium DCGL values, including the west and east tunnel and vault sample locations. Refer to Survey Area E, Attachment C-5, for survey results.

In addition to the above 535 TSA and RSA measurements, additional surveys were collected from the 991 Cluster as follows:

- 181 beryllium smears taken throughout the 991 Cluster were analyzed for RSA. None of the RSA measurements indicated elevated activity above the transuranic RSA DCGL value. Refer to Attachment C-9 for survey results.
- 11 biased RSA measurements inside the HEPA ventilation ducting of the tunnels and vaults (i.e., Buildings 996, 997, 998 and 999). None of the measurements indicated elevated activity above the transuranic DCGL values. Refer to Survey Area E, Attachment C-5, for survey results.

9

- Eight locations were chosen for core sampling to investigate the potential for sealed-over basement rooms. After coring through eight locations in the basement walls at biased locations, all that was found was dirt, no void spaces or sealed-over. Soil sample results of the dirt were all less than the RFCA Tier II radiological soil action levels. Pre and post TSA and RSA measurements were also taken at each of the eight locations and all results were less than transuranic DCGL values. Refer to Attachment C-9 for soil and survey results.
- A comprehensive radiological survey of the 991 roof plenum was performed on December 17, 1999 which indicated all removable and fixed measurements below the applicable RLC DCGL values, refer to Attachment C-9 for survey results.
- Holdup measurements have been conducted in potential holdup areas within the 991 Cluster facility structures, equipment and systems, areas such as the plenum filters and Vault 150. The hold up scan results did not indicate the presence of any Special Nuclear Material within the detection limits of the scan equipment. Additionally, Building 991 contains minimal equipment (e.g., x-ray machine, some tanks, and hoods); removal of this equipment will also be straightforward and will utilize industry standard, proven methods.

Radioactive waste storage containers were stored in Buildings 991, 991 Tunnels, 996, 997, 998 and 999 when this RLC was conducted. However, there is no documented history of any spills or leaks from any of the waste containers since waste storage operations began. No known non-encapsulated manufacturing operations have taken place in any of the 991 Cluster buildings. The radioactive waste storage containers contributed significantly to beta-gamma background levels in many areas of 991. The only elevated beta measurements observed were the measurements collected near these storage containers, therefore, all elevated beta measurements were attributed to the waste storage containers.

Many areas of 991, especially the tunnels, vaults, and basement had elevated levels of naturally-occurring radon. During the RLC, up to 3,000 dpm/100cm^2 TSA and 300 dpm/100cm^2 RSA was detected on the clothing of the characterization members. All elevated clothing decayed to free release limits. Initial RSA measurements on the ventilation louvers indicated removable contamination levels of up to 576 dpm/100cm^2. This also decayed to free release limits. All 772 smears taken from the interior of 991decayed to below the transuranic RSA release limit of 20 dpm/100cm^2. On this basis, all elevated alpha and beta TSA and RSA measurements were confirmed to be either from the waste storage containers or the elevated naturally-occurring radon levels. Some floor areas were not accessible for measurement due to the waste storage (refer to Attachment C-10 for inaccessible floor area maps), and will be characterized during in-process and/or PDS characterization.

10

In accordance with the PDSP, the exterior surfaces of the Area 2, Group 2 facilities were PDS characterized. A total of 93 TSA measurements and 93 RSA measurements were taken from the exterior surfaces, and 3% scan surveys were performed on the exterior surfaces. Refer to Survey Unit 991-B-009, Attachment C-7 and Survey Unit 991-B-010, Attachment C-8, for survey results. Elevated contamination levels were discovered and investigated per RSP 16.02 requirements. Follow up investigation action included re-surveys and obtaining media samples. The investigations revealed that all exterior facility surfaces meet the PDSP radiological release criteria. All other exterior measurements were less than the transuranic DCGL values. No additional PDS radiological surveys are required except if a contamination event were to occur during decommissioning activities. Follow up action to a contamination event will require a verification survey prior to building demolition to ensure that PDSP release limits are met. Additionally, a confirmatory smear survey shall be performed of the exterior surfaces prior to demolition.

As a result of the information presented above, Building 991 was confirmed to be a Type 2 facility, and Buildings 985, 996, 997, 998, 999, and the 991 Tunnels are confirmed to be Type 1 facilities. Other factors supporting this typing include the following:

- B991 Cluster buildings did not process bulk radioactive liquids and therefore has little, if any potential for contaminated piping, unlike the major plutonium facilities.
- Systems and equipment can be disposed of using proven, straight forward industry D&D techniques.
- Minimal size reduction is required of the systems and equipment.
- Areas that were inaccessible during this RLC (due to waste storage) are not expected to contain any radiological contamination.
- Hold up scan results did not indicate the presence of any Special Nuclear Material.
- Facility surfaces requiring decontamination can be decontaminated using proven, straight forward, industry techniques.

Radiological survey data, soil sample data, media data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachments C1 – C10, Radiological Data Summary and Survey Maps.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

The Area 2, Group 2 facilities were characterized for chemical hazards per the RLCP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on or in these facilities. Based upon a review of historical and process knowledge, visual inspections, and RLCP DQOs, additional sampling needs were determined. A Chemical Characterization Plan (refer to RISS Characterization Project files for the Chemical Characterization Plan for the 991 Cluster "anticipated" Type 2 facilities) was developed during the planning phase that describes sampling requirements and the justification for the sample locations and estimated sample numbers. Contaminants of concern included asbestos, beryllium, RCRA/CERCLA constituents, and PCBs.

Refer to Attachment D, Chemical Summary Data and Sample Maps, for details on sample results and sample locations. A summary of each chemical contaminate of concern is described below.

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted in the aforementioned buildings in accordance with the RLCP. A CDPHE-certified asbestos inspector conducted the inspection and sampling in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1.* Building materials suspected of containing asbestos were identified for sampling at the discretion of the inspector.

A comprehensive, invasive asbestos inspection was conducted to determine the presence of friable and non-friable asbestos containing building materials. The following friable and non-friable asbestos containing materials were identified:

12

Building	Material	Friable or Non-Friable	Approximate Quantities
991	Transite Wall Panel	Category 2 Non-friable	19,600 square feet
991	Drywall and Joint Compound	Category 2 Non-Friable	6,200 square feet
991	Black Roofing Tar and Silver Paint	Category 1 Non-Friable	24,880 square feet
991	9" x 9" vinyl floor tile and mastic	Category 1 Non-Friable	21,397 square feet
991	12" x 12" vinyl floor tile and mastic	Category 1 Non-Friable	7,133 square feet
991	Acoustical Drop Ceiling Tiles	Friable	11,364 square feet
991	Thermal Systems Insulation	Friable	11,896 lineal feet
991 Tunnels	Thermal Systems Insulation	Friable	1,958 lineal feet
996	9" x 9" vinyl floor tile and mastic	Category 1 Non-Friable	3,230 square feet

The Building 985 filter plenum was not entered to determine asbestos containing building materials. Any building material in the plenum system that could contain asbestos is assumed to be asbestos containing until further in-process characterization is performed.

Asbestos laboratory analysis data and location maps are contained in Attachment D-1, "Chemical Data Summaries and Sample Maps." Maps that did not contain any sample locations were not included in this report.

4.2 Beryllium (Be)

Building 991 was the Product Warehouse for RFETS, and is connected by underground tunnels to four storage vaults (i.e., Buildings 996, 997, 998 and 999). Beryllium containing weapon components were assembled and stored within these structures. Building 985 is the plenum filtration building that established and maintained negative air pressure on the 996, 997, and 999 structures of the 991 Cluster. Based on the HSAR, Interview Checklists, and beryllium sampling data in the RFETS Industrial Hygiene Information System (IHIS), there was adequate historical and process knowledge to conclude that beryllium was present in these buildings. IHIS beryllium data obtained from the HEPA filtration unit on the roof of Building 991, reveals beryllium surface contamination on the building-side of the HEPA filter bank up to 2.0 $\mu g/100cm^2$. Consequently, random and biased beryllium sampling was performed in Buildings 996, 997, 998, 999 and the 991 Tunnels in accordance with the RLCP and the *Beryllium Characterization Procedure, PRO-536-BCPR, Revision 0, September 9, 1999.*

13

Random sample locations were computer generated, while biased sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition. The main floor of Building 991 was not sampled since there was sufficient existing beryllium bulk sampling data to preclude the need for more samples. Biased beryllium sampling was performed in the basement/utility tunnel of Building 991. Characterization personnel entered the HEPA ventilation ducting for beryllium sampling purposes in Buildings 996, 997, 998, 999; and Corridors A, B, and C of the 991 Tunnels. All beryllium sample results taken during the RLCR characterization from the 991 Cluster were less than the investigative limit of 0.1 µg/100 cm^2, except those taken in the basement utility tunnel. There were (22) elevated beryllium results (up to 0.655 µg/100cm^2) from the basement utility tunnel of Building 991 in the overhead utilities.

Based on IHIS data collected from January 1995 to March 2002, one (1) sample (991-09101999-35-008) in Building 985 exceeded the unrestricted release limit of 0.2 µg/100cm^2 at 1.5 µg/100cm^2. This small, localized area was decontaminated and follow-up beryllium smear results were <0.1 µg/100cm^2. Subsequent routine beryllium sampling of Building 985 has not discovered any more contamination above 0.1 µg/100cm^2.

Therefore, IHIS beryllium sampling data and newly acquired RLC beryllium data, indicates that beryllium is not a potential hazard to the environment or personnel in Buildings 985, 996, 997, 998, 999 and the 991 Tunnels, and are therefore confirmed as Type 1 facilities from a beryllium standpoint. However, since beryllium was found above the unrestricted release limit of 0.2 µg/100cm^2 in the B991 basement utility tunnel and inside portions of the B991 ventilation system (e.g., building side of the HEPA filter bank), Building 991 is confirmed as a Type 2 facility from a beryllium standpoint. Beryllium laboratory sample data and location maps are contained in Attachment D-2, "Chemical Data Summaries and Sample Maps." Maps that did not contain any sample locations were not included in this report. IHIS laboratory beryllium data is located in the project files.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on a review of the HSAR, interviews, and facility walkdowns, there is no indication that the Area 2, Group 2 facilities have been contaminated by RCRA/CERLCA constituents. Chemicals have been used within most of the facilities, and wastes have been stored in some, but there are no records or visible signs of chemical releases. Therefore, no sampling and analysis for RCRA/CERCLA constituents was conducted during the RLC. Buildings 991, 996 and 998 are currently being used to store waste drums and will be further characterized during in-process and/or PDS characterization efforts after all waste containers have been removed. In addition, some areas constitute RCRA waste storage areas and will be closed pursuant to Colorado Hazardous Waste Act (CHWA) requirements.

14

The buildings may contain RCRA regulated items, such as mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, leaded glass and lead-acid batteries. These items will be removed prior to demolition and managed in accordance with the CHWA.

Sampling for lead in paint in the Area 2, Group 2 facilities was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSAR, interviews, and facility walkdowns of the Area 2, Group 2 facilities, no PCB-containing equipment were ever used or stored in the buildings, making the potential for PCB contamination resulting from spills highly unlikely. PCB waste, such as light ballast, has been stored in these facilities, but there was no indication that contamination had occurred. Therefore, PCB sampling was not performed during the RLC. Buildings 991, 996 and 998 are currently being used to store waste drums and will be further characterized during in-process and/or PDS characterization efforts after all waste containers have been removed.

Based on the age of the facilities (constructed prior to 1980), paints used may contain PCBs, and painted surfaces will need to be disposed of as PCB Bulk Product Waste. Painted concrete surfaces can be used as backfill on site in accordance with approval received from EPA in November 2001 (letter from K. Clough, US EPA Region 8, to J. Legare, DOE RFFO, 8EPR-F, Approval of the Risk-Based Approach for Polychlorinated Biphenyls (PCB)-Based Painted Concrete), provided the concrete meets the unrestricted-release criteria outlined in the Concrete Recycling RSOP.

Some facilities may contain fluorescent light ballast that contain PCBs. Therefore, fluorescent light fixtures will be inspected to identify PCB ballast during removal operations. PCB ballast will be identified based on factors such as labeling (e.g., PCB-containing and non-PCB-containing), manufacturer, and date of manufacturing. All ballast that do not indicate non-PCB-containing are assumed to be PCB-containing.

Based upon the chemical hazards identified above (i.e., asbestos, beryllium, RCRA/CERCLA constituents and PCBs), Building 991 is confirmed to be Type 2 facility and Buildings 985, 996, 997, 998, 999 and the east and west storage vault tunnels are confirmed to be Type 1 facilities, from a chemical standpoint. Asbestos and beryllium contamination will be managed and decontaminated using proven straightforward remediation techniques. Refer to Attachments D, Chemical Summary Data and Sample Maps, for details on sample results and sample locations.

15

5 PHYSICAL HAZARDS

Physical hazards associated with Area 2, Group 2 facilities consist of those common to standard industrial environments and include hazards associated with energized systems, utilities, drum storage and movement, and trips and falls. The unique hazards associated with these facilities consist of the underground reinforced tunnels and vaults, the U-shaped basement, and x-ray equipment. The tunnel walls and ceiling are approximately 15-inch thick steel-reinforced poured concrete. The vaults walls range from 15 inches to 14 feet thick walls, and the roof and ceiling range from 4 feet to 12 feet thick steel-reinforced poured concrete. The north side of B991 was built into a hillside. There are no unique hazards associated with the facilities that cannot be managed using proven, straightforward industry-standard D&D techniques.

All areas of the facilities (e.g., ventilation chases, air tunnels, pits, etc.) are accessible and will not require the use of robotic equipment to complete D&D. The facilities have been well maintained and are in relatively good physical condition, and therefore, do not present hazards associated with building deterioration. The 991 west storage vault tunnel has some minor cracking in the wall concrete. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which are based on OSHA regulations, DOE orders, and standard industry practices. Based on the physical hazards assessment, Building 991 is confirmed as a Type 2 facility, and Buildings 985, 996, 997, 998, 999 and the east and west storage vault tunnels are confirmed to be Type 1 facilities.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Area 2, Group 2 facilities, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments C and D) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original DQOs of the project.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- the *number* of samples and surveys;
- the *types* of samples and surveys;
- the sampling/survey process as implemented "in the field"; and,
- the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment E.

16

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The disposition of Area 2, Group 2 facilities will generate a variety of wastes, including radiological, beryllium, asbestos, PCB and hazardous wastes. Estimated waste types and waste volumes are presented below by facility. Asbestos containing material, hazardous waste items (e.g., mercury thermostats, fluorescent light bulbs, mercury vapor light bulbs, mercury containing gauges, circuit boards, leaded glass and lead-acid batteries), and PCB Bulk Product Waste, including PCB ballast, will be managed pursuant to Site asbestos abatement and waste management procedures.

Waste Volume Estimates and Material Types, Area 2, Group 2

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
991	83,320	500	6,000	2,500	3,500	Transite Wall Panels – 8,166 Drywall and Joint Compound – 1,033 Black Roofing Tar and Silver Paint – 10,366 Vinyl Floor Tile and Mastic – 5,293 Ceiling Tile – 1,894 Thermal Systems Insulation – 3,464	Be Waste – 100 LLW – 10
985	18,000	None	980	None	None	None	900 – pipe insulation 400 – fiberglass insulation 600 – roofing material
991 Tunnel	37,000	None	2,500	None	None	Thermal Systems Insulation – 489	None
996	55,000	600	120	None	None	Vinyl Floor Tile and Mastic -- 808	None
997	55,000	600	120	None	None	None	None
998	31,200	None	20	None	None	None	None
999	28,800	None	20	None	None	None	None

17

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based upon the elevated radiological and beryllium data presented in this RLCR, Building 991 is considered to be Type 2 facility facilities pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). Based upon the data presented in this RLCR for Buildings 985, 996, 997, 998, 999, and the 991 Tunnels (i.e., no elevated radiological, beryllium or chemical contamination), these Buildings are considered to be Type 1 facilities pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). These classifications are based on a review of historical and process knowledge, and existing and newly acquired RLC data, and the relative complexity associated with decommissioning the facilities. Decontamination, dismantlement and demolition will be accomplished using industry standard techniques, and will not require unique or non-standard techniques. The radiological, chemical and physical hazards are not significant or overly intermingled and the hazards can be controlled through standard, conventional means.

The PDS of the Area 2, Group 2 facility exterior surfaces was performed in accordance with the DDCP and PDSP, all PDSP DQO's were met, and all data satisfied the PDSP DQA criteria and unrestricted release criteria. No additional exterior PDS radiological surveys are required except if a contamination event were to occur during decommissioning activities. Follow up action to a contamination event will require a verification survey prior to building demolition to ensure that PDSP release limits are met. Additionally, a confirmation smear survey shall be performed of the exterior surfaces prior to demolition.

The RLC of the Area 2, Group 2 facilities (interior surfaces) was performed in accordance with the DDCP and RLCP, all RLCP DQOs were met, and all data satisfied the RLCP DQA criteria. Demolition of these facilities will generate asbestos, hazardous and PCB wastes. All wastes will be disposed of in compliance with EPA, DOT, DOE and CDPHE regulations. Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

Areas that were inaccessible during this RLC will be characterized during in-process and/or the PDS characterization. Since the RLC of the interior facility surfaces of the Area 2, Group 2 facilities was performed utilizing the RLCP, an additional PDS will be required of the interior facility surfaces of all the Area 2, Group 2 facilities (i.e., Buildings 991, 991 Tunnels, 985, 996, 997, 998 & 999) prior to demolition utilizing the PDSP.

9 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. Rocky Flats Cleanup Agreement (RFCA), July 19, 1996.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment."

EPA, 1994.

"The Data Quality Objective Process," EPA QA/G-4, K-H, 1999.

Decommissioning Program Plan, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 3, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 0, July 15, 2002.

MARSSIM - Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure,* Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, Asbestos Characterization Procedure, Revision 0, August 24, 1999.

PRO-536-BCPR, Beryllium Characterization Procedure, Revision 0, August 24, 1999.

RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.

RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

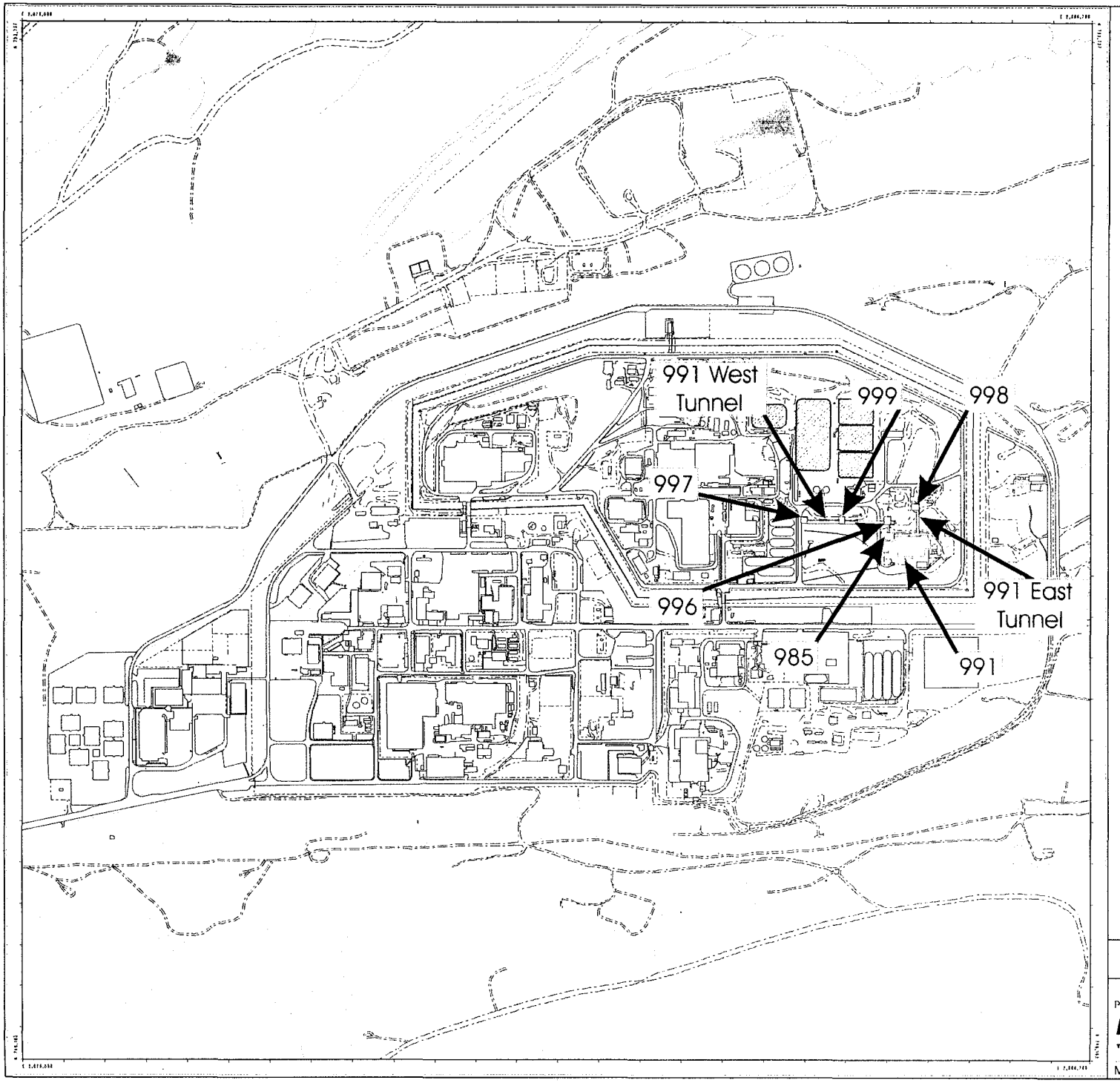
RFCA Standard Operation Protocol for Recycling Concrete, September 28, 1999.

RFETS, Historical Site Assessment for the 991 Cluster, March 4, 2002.

19

ATTACHMENT A

Facility Location Map



991 Cluster
985, 991, 996, 997, 998, 999 & 991 East/West Tunnel

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEPs)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the orthophotographs. 1/95

Scale = 1 : 12450
1 inch represents approximately 1038 feet
250 0 500 1000 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:
DynCorp
THE ART OF TECHNOLOGY

Prepared for:
KAISER-HILL COMPANY

MAP ID: FY 2002

January 9, 2003

NT_Svr w:/projects/fy2002/02-0355/991-E&W.cdr

ATTACHMENT B

Historical Site Assessment Report

D&D RISS Facility Characterization
Historical Site Assessment Report
May 7, 2002, Rev. 1

Facility ID: Area 2 – Group 2 Building 991 Cluster Type 2 and Type 1 Facilities which includes: Building 991 Product Warehouse, Building 984 Shipping Container Storage Facility, Building 985 Filter Plenum for B996/B997/999, 991TUN Tunnels Between Facilities, Building 992 Guard Post, Building 993 Security Storage Vault, Building 996 Storage Vault for B991, Building 997 Storage Vault for B991, Building 998 Storage Vault for B991, Building 999 Storage Vault for B991, Building 989 Emergency Generator for B991

Anticipated Facility Type (1, 2, or 3): Building 991 Type = 2, Building 984 = Type 1, Building 985 Type = 1, 991TUN = Type 2, Building 992 = Type 1, Building 993 = Type 1, Building 996 Type = 2, Building 997 Type = 2, Building 998 Type = 2, Building 999 Type = 2, Building 989 Type = 1

This facility - specific Historical Site Assessment (HSA) has been performed in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Physical Description:

Building 991is listed as the Product Warehouse for RFETS on the Closure Projects Facility List. Building 991 was constructed and put into service in 1952. Building 991 sits on the east side of the Plant, approximately 100 yards north of Central Avenue. Building 991was constructed in a land depression or natural valley. Building 991 has steel-reinforced poured concrete superstructure. The size of Building 991 is approximately 165 feet wide by approximately 375 feet long which includes the Shipping Dock Area and open covered storage area on the west. Building 991 is approximately 22 feet above ground at the top of the concrete parapet (a low wall or concrete rail/wall above the roof/deck to protect the roof) for the south office and old lab areas. The north part of Building has an additional 14 feet of height which is the high-bay old process area of the building. Building 991 has approximately 37,880 square feet of floor space. Building 991 has a U-shaped Utility Tunnel which provides steam, cooling water, electrical and other utilities to the building. The Building 991 has steel-reinforced poured concrete floors, walls and roof-deck. Many of the Building 991 office hallways and office rooms have Transite® partition walls. Floor tile and carpeting are used in many offices and hallways of Building 991. A section in the Basement Utility Tunnel also has very old floor tiles that probably contain asbestos. The process and storage areas of Building 991 have steel-reinforced poured concrete walls and concrete block walls. The Building 991 east-west high-bay area has 24-inch-steel-reinforced poured concrete walls that support an overhead Crane Rail that was originally used to move heavy objects and/or equipment. The Building 991 concrete roof deck has an additional poured light-weight concrete flat roof with the BUR flat roof design sealed with tar and gravel. The Building 991 East Dock and west covered storage area have a steel roof decks. Including these two roofs Building 991 has seven different roof sections.

The Building 991 utilities at one time included steam, but the Building 991 heating system has been converted to a natural gas re-circulating hot water heating system. Building 991 has electrical power, fluorescent lighting, some sodium and/or mercury vapor lighting exist both inside and outside. Building 991also has hot and cold running water, LSDW System, Criticality Detector and Alarm System, a CAM/SAAM System including Health Physics Air Sampling Vacuum System, telephones, Fire Sprinkler and Alarm Systems, and various building utility heating and ventilation control systems.

Building 984 the Shipping Container Storage Facility, also known as the TRU Waste Storage Facility for RFETS, is located directly south of Building 991.Building 984 has a steel I-beam support structure and it is constructed from corrugated metal sandwiched over insulation. Building 984 is constructed on two concrete slabs, as the building was constructed at two different construction phases. The original Building 984 was 24' wide X 30' long X 16' high at the roof eve. The east section or addition section of Building 984 is approximately 40' wide X 75' long X 22' high at the roof eve. The floor space for Building 984 is approximately 3,700 square feet. Both Building 984 sections are supported by steel I-beams. Building 984 was constructed in 1986 and it has approximately 3200 square feet of floor space. Building 984 has a heat-pump heating system, it has electricity for lighting, air exhausters, a Criticality Detector and Alarm System, and a LSDW System.

Physical Description (Con't):

Building 985 is the Filter Plenum Facility for Buildings 996, 997, and Building 999 within the Building 991 Cluster. Building 985 is approximately 40' wide X 60' long X 17' high at the roof eve. Building 985 contains approximately 2,400 square feet of floor space. Building 985 was constructed in 1974 and is located northwest of Building 991 on the hillside. Building 985 has steel-reinforced concrete superstructure constructed on a steel-reinforced poured concrete slab. In between the concrete vertical support beams, the concrete panels appeared to be pre-poured pre-stressed concrete panels set in place and sealed with concrete, grout, and RTV type sealant. The slab-floor of Building 985 has a tank-pit that is approximately 12 feet deep (below the floor level) on the east side for the plenum firewater deluge-tank. The tank-pit has two pumps, a transfer pump and a sump pump. The exterior wall sections between the concrete vertical support beams are pre-cast pre-stressed concrete wall panels. Building 985 air-lock door entrances are constructed from concrete block. The facility has an exterior air-lock room entrance on the northeast corner and it has an exterior air-lock room entrance on the southeast corner of the facility. Building 985 has a steel-reinforced poured concrete roof/deck. The Building 985 built-up-roof includes a tar-gravel sealed over an aluminum coating, a 4-ply asbestos membrane over sheet 1-5/8' fiberglass insulation on the concrete roof-deck. Building 985 has an exterior Roof Access Ladder, exterior fire hose/firewater hookup, and Building 985 exterior Breathing-Air and communications hookups.

The Building 985 Roof has two roof drains and a parapet wall around the perimeter of the roof. Building 985 has a Criticality Detector/Alarm System, a CAM/SAAM System including Health Physics Air Sampling Vacuum System, a Fire Sprinkler/Alarm System, and a LSDW System. Building 985's main equipment components include Building Supply Air Filter Plenum FP-602/F-602 which has hot water heating coils, Building Exhaust Filter Plenum FP-601/F-601A/F-601B, along with supply and exhaust fans and motors, and waste holding Tank T-601. Building 985 is not heated, but the plenum air filtration system carries over room temperature air so the building does not get down to freezing temperature. As a freezing pre-caution fire-water and other process water lines are heat-traced to protect them from freezing.

The 991TUN is an underground tunnel between Building 991 and three of the four underground Building 991 Cluster Storage Vault Facilities, Buildings 996, 997 and Building 999. The underground 991 TUN is constructed from all approximately 18-inch thick steel-reinforced poured concrete floors, walls and ceiling/roof. The 991TUN has a 16' square Turn-Around Area at the west end and the walls and tunnel roof have an additional 18-inch thick steel-reinforced poured concrete. The 991TUN is approximately 8' wide X 12'6"' high X 700' long. The 991TUN has approximately 6,000 square feet of underground floor space. The 991TUN areas are equipped with air ventilation from Building 985 and a Criticality Detector/Alarm System, a CAM/SAAM System including Health Physics Air Sampling Vacuum System, a Fire Sprinkler/Alarm System, and a LSDW System. The walls and ceiling of the 991TUN are painted.

Building 992 is the two-level Guard-Post for the Building 991 Cluster, and it was constructed in 1952. Building 992 is located at the southwest corner of the Building 991 Cluster. Building 992 is a steel-reinforced poured concrete building which includes the Main Floor slab, ceiling, parts of the Second Floor walls and the facility also has a steel-reinforced poured concrete roof deck. The ground floor of Building 992 is approximately 16'6" wide by 16'6"long by 8'10" high. The Main Floor steel-reinforced poured concrete walls extend 4' below grade and are sitting on steel-reinforced poured concrete footings. The Second Floor of Building 992 is octagon-shaped with windows on all sides for 360 degree area vision. Building 992 has 370 square feet of floor space which includes the Second Floor. The Main Floor of Building 992 has a Security Badge Access Port and window on the southeast corner and a Guard Access Door on the northeast corner; the other three wall on the Main Floor each has a large window for Guard viewing in all directions. The Main Floor has a restroom and a stairway access to the Guards Second Floor Observation Room. Building 992 has electricity for lighting, a LSDW System, alarms, and other instrumentation. Building 992 is heated by natural gas. Building 992 has two air conditioning units, a Second Floor exhaust fan, and two exterior mercury-vapor lights.

Physical Description (Con't):

Building 993 is Security Storage Vault Facility is located approximately 150 yards east of Building 991. Building 993 is a steel framed Butler®-type metal building constructed on a concrete slab. Building 993 has electrical power for lighting and various alarms. Building 993 has two personnel access doors, one on the south end of the west wall corner and one on the east end of the south wall. The south wall also has a large truck access sliding-door, which is now boarded up inside with plywood. Building 993 is approximately 30' wide X 40' long X 15' high at the roof eve and slopes to the north for roof drainage. Building 993 has approximately 1,200 square feet of floor space. The Building 993 roof is also corrugated metal. Building 993 has four exterior mercury-vapor lights for night operations, which is included in the Building 991 Cluster. The floor has a 12 foot in diameter and 8 foot deep concrete pit, which was used for explosive bonding testing. In the late 1970s this pit was filled with concrete.

Building 996 is an underground Storage Vault Facility for Building 991 and it is located directly north of Building 991/885. The access tunnel, 991TUN, to Building 996 goes northeast from Building 991 and directly underneath Building 985. Building 996 was constructed in 1952 at the same time Building 991 was built. Buildings 996 and 997 are of identical design whose dimensions are 60' wide X 68' long X 16' high (underground). These two storage vaults have exterior walls of steel-reinforced concrete that are approximately 14' thick and roof/ceilings of steel-reinforced concrete that are 12' thick. The underground footprint of Building 996 is approximately 4,100 square feet, but the underground floor space is approximately 1,400 square feet. The Building 996 is equipped with air ventilation from Building 985 and a Criticality Detector/Alarm System, a CAM/SAAM System including Health Physics Air Sampling Vacuum System, a Fire Sprinkler/Alarm System, and a LSDW System. The walls, floors and ceiling of Building 996 are painted. Building 996 is partitioned into six different vault-type rooms and each room has a bank-type vault solid-steel door on it.

Building 997 is an underground Storage Vault Facility for Building 991. Building 997 is the underground Storage Vault Facility at the west end of the 991TUN which is approximately 600 feet directly west of Building 996 with Building 999 halfway in between Buildings 997 and 996. Buildings 996 and 997 are of identical design whose dimensions are 60' wide X 68' long X 16' high (underground). These two storage vaults have exterior walls of steel-reinforced concrete that are approximately 14'-thick and roof/ceilings of steel-reinforced concrete that are 12' thick. The underground footprint of Building 997 is approximately 4,100 square feet, but the underground floor space is approximately 1,400 square feet. Building 997 is equipped with air ventilation from Building 985 and a Criticality Detector/Alarm System, a CAM/SAAM System including Health Physics Air Sampling Vacuum System, a Fire Sprinkler/Alarm System, and a LSDW System. The walls, floors and ceiling of Building 997 are painted. Building 997 is partitioned into six different vault-type rooms and each room has a bank-type vault solid-steel door on it.

Building 998 is an underground Storage Vault Facility for Building 991. Building 998 is located underground, approximately 180' directly north of the northwest corner of Building 991. Building 998 has its own dedicated access tunnel, Corridor A. Building 998, also designated Room 300, is approximately 20' wide X 43'9"' long X 12 feet high and the walls, floor and the roof/ceiling of steel-reinforced concrete that are 4' thick. The underground floor space of Building 998 is approximately 2,640 square feet which includes the 180' long Corridor A, Access Tunnel. Building 998 is equipped with air ventilation from Building 991, a Criticality Detector/Alarm System, a CAM/SAAM System including Health Physics Air Sampling Vacuum System, a Fire Sprinkler/Alarm System, and a LSDW System. The walls, floors and ceiling of Building 998 are painted.

Building 999 is an underground Storage Vault Facility for Building 991. The facility is located directly northwest of Building 991 and contains approximately 384 square feet of floor space. Building 998, also designated Room 500, is approximately 33' wide X 49' lone X 12 feet high and the walls and floor are 18" thick steel-reinforced concrete; and the roof/ceiling of steel-reinforced concrete that are 4' thick. The underground floor space of Building 999 is approximately 2,000 square feet. Building 999 is equipped with air ventilation from Building 985 and a Criticality Detector/Alarm System, a CAM/SAAM System including Health Physics Air Sampling Vacuum System, a Fire Sprinkler/Alarm System, and a LSDW System. The walls, floors and ceiling of Building 999 are painted. Building 997 is partitioned into four different storage rooms.

Physical Description (Con't):

Building 989 is the Emergency Facility for the Building 991 Cluster. Building 989 is a single story facility and has steel-reinforced poured concrete floor slab, walls and roof-deck. Building 989 is approximately 16' wide X 24' long X 12' high and it has a steel-reinforced poured concrete floor roof. Building 989 has approximately 384 square feet of floor space. Building 989 has a LSDW System. Building 989 has a single steel entry door on the west and a double steel entry door on the south. Building 989 has an above ground diesel fuel tank and concrete tank-berm on the east side.

Historical Operations:

Building 991 has always been the Product Warehouse for the RFETS. Building 991 was the original final assembly building. Plutonium, enriched uranium, depleted uranium and components from other materials, which would include beryllium, were assembled into final products and stored for off-site shipment. Final assembly operations were in Building 991 were discontinued in 1958 and moved to another building, Building 777. Historically Building 991 also housed nondestructive testing operations, a metallography laboratory, production control operations, and other support operations.
Building 984 has always been the Shipping Container Storage Facility, RCRA Unit 984.1.
Building 985 has always been the Filter Plenum Facility for Underground Storage Vaults, Buildings 996, 997, and Building 999.
The 991TUN facility has always been the access tunnel from Building 991 to Underground Storage Vaults, Buildings 996, 997, and Building 999.
Building 992 has always been the Building 991 Cluster Facilities Guard Post.
Building 993 was a Research and Development Explosive Forming Facility.
Building 996 was always an Underground Vault Facility for Building 991.
Building 997 was always an Underground Vault Facility for Building 991.
Building 998 was always an Underground Vault Facility for Building 991.
Building 999 was always an Underground Vault Facility for Building 991.
Building 989 has always been the Emergency Generator Facility for the Building 991 Cluster Facilities.

Current Operational Status

~~Building 991 is currently in service as a TRU Waste Drum Storage Facility, a Hazardous Waste Drum Storage Facility,~~ a Permitted Storage Facility and a Receiving and Shipping Storage of all Waste Containers for the RFETS.
Building 984 has always been the Shipping Container Storage Facility, RCRA Unit 984.1 and it is currently in service as a TRU Waste Drum Storage Facility, a Hazardous Waste Drum Storage Facility, a Permitted Storage Facility and a Receiving and Shipping Storage of all Waste Containers for the RFETS.
Building 985 has always been, and currently is in service , the Filter Plenum Facility for Underground Storage Vaults, Buildings 996, 997, and Building 999.
The 991TUN has always been and currently is the access tunnel from Building 991 to Underground Storage Vaults, Buildings 996, 997, and Building 999.
Building 992 is currently Out of Service.
Building 993 is currently in service as a Security Storage Vault for Blank Ammunition.
Building 996 is currently in service as an Underground Vault Facility for Building 991 and it contains 55-gallon waste drums.
Building 997 is currently empty and Out of Service.
Building 998 is currently in service as an Underground Vault Facility for Building 991 and it contains 55-gallon waste drums.
Building 999 is currently empty and Out of Service.
Building 989 has always been the Emergency Generator Facility for the Building 991 Cluster Facilities.

26

Contaminants of Concern

Asbestos

Describe any potential, likely, or known sources of Asbestos:

All of the Building 991 Facilities might have some asbestos containing materials (ACM) of construction because the facilities were constructed in 1952-1974 time frame except Building 984 which was constructed in 1986. All of the Building 991 Cluster Facilities have partition walls, roof, and pipe insulation might contain asbestos. Although the waste stored in Buildings 991, 996, 998, and 984 may have contained trace amounts of asbestos the waste was not regulated as a TSCA waste. Building 992 (The Guard Post) might have some ACM material of construction in wall, roof, and pipe insulation.

Beryllium (Be)

Describe any potential, likely, or known Be production or storage locations:

Building 991 is on the RFETS Beryllium (Be) Areas Historical and Present list in Rooms 2 (Basement Tunnel), 110, 122, 134,140/140A/141, 122A, Building 991 has other potentially Beryllium contaminated systems, and Building 991 Main Plenum exhausted (historically) beryllium operations to the Building 991 Roof.

Building 984 stores Low Level and TRU Wastes drums that are beryllium contaminated.

Building 985 contains Plenum 601 for Building 991 that historically exhausted beryllium operations. Building 985 has a potential for beryllium contaminated systems (internally).

Building 996 stores Low Level and TRU Wastes drums that are beryllium contaminated.

Building 997 historically stored Low Level and TRU Wastes drums that are beryllium contaminated.

Building 998 stores Low Level and TRU Wastes drums that are beryllium contaminated.

Building 999 historically stored Low Level and TRU Wastes drums that are beryllium contaminated.

One interviewee said that at one time beryllium parts, beryllium assemblies, and beryllium testing was conducted throughout Building 991. In addition low-level waste drums/crates containing Be were stored in Building 991.

Summarize any recent Be sampling results:

The Industrial Hygiene Department collects frequent Be samples from may of the facilities in the 991 Cluster. See the Industrial Hygiene Department for a list of resent Be samples collected. No known beryllium contamination exists in the Building 991 Cluster Type 1 Facilities, Buildings 989, 992, and Building 993.

Lead

Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):

Most of the Building 991Cluster Facilities were constructed in 1952-1974 time frame, therefore it may contain lead-based paints. No lead operations were known to have occurred in Building 991. Historically lead shielding and/or lead-shielded gloveboxes and/or hoods may have been used in Building 991, but currently the facility has no gloveboxes or hoods. All of the other Building 991 Cluster Type 1 and Type 2 Facilities that have paint on them, might have been painted with lead-based paints; this includes 991TUN, Buildings 996, 997, 998, 999, and Building 989.

21

RCRA/CERCLA Constituents

Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, processes):

Building 991 is currently being used to store drums of hazardous waste some of which contain RCRA/CERCLA constituents. Cleaning chemicals were used and stored in Building 991. Building 991 has a WSRIC. Building 984 is listed on "The Master List of RCRA Units".

Building 991 has Room 170 listed on "The Master List of RCRA Units" as a Permitted Area, Unit 991.1.

Building 984 is a Permitted Storage Area, Unit 984.1

Building 993 has a "Special Material Storage" area listed on "The Master List of RCRA Units" as a Permitted Area, Unit 993.1. Dynamite was used in the explosive forming testing performed in the pit in the floor of this building. The pit was filled with water during this testing, which sometimes used depleted uranium alloys.

Building 996 has "Container Storage, 996 Vault", never used for hazardous waste and not subject to RCRA regulation, Unit 90.128.

Describe any potential, likely, or known spill locations (and sources, if any):

Small volume spills of solvents, acids and other RCRA/CERCLA constituents likely occurred, but no large volume chemical spills have been documented in any of the Building 991 Cluster facilities. See this environmental Concerns section below for additional release information documented in IHSSs, PACs, and UBCs.

Describe methods in which spills were mitigated, if any:

Unknown

PCBs

Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):

Buildings 991, 985, 992, 993, 996, 997, 998, and Building 999 may contain PCB/lead-based paints. Building 991 Cluster Type 1 and Type 2 Facilities have lighting ballasts that might contain PCBs. No known equipment containing PCBs, were ever located in Building 991. The Building 991 Cluster, exterior power transformers, Transformers 991-1 and 991-2, have been known to contain PCBs These transformer have been documented in PAC 900-1306, "Transformers 991-1 and 991-2" and was recommended for NFA in the 1996 HRR Annual Update.

Describe any potential, likely, or known spill locations (and sources, if any):

Building 991 Cluster, exterior power transformers, Transformers 991-1 and 991-2 historically leaked at least on one occasion.

Describe methods in which spills were mitigated, if any:

Unknown

Radiological Contaminants

Describe any potential, likely, or known radiological production or storage locations:

Building 991 has radiological contaminated drums stored in most rooms is the back area, behind the locked entry doors. Building 984 stores low-level contaminated waste drums and low-level contaminated waste crates from Building 991 and the U/Pu contaminated buildings at RFETS until shipments can be made out of the facility. Buildings 991 and 984 are currently posted as a RMA. The pit in the floor slab (which was filled with water during the testing) of Building 993 was used to test the forming of flat pieces of various metal. Depleted uranium alloys were sometimes used in these tests, there is no known building contamination resulting from these tests.

Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):

Small volume spills and occasional cross-contamination form the exterior of the waste containers stored in these building may have occurred, but no large volume spills have been documented in any of the Building 991 Cluster facilities. See the Environmental Concerns section for additional release information related to IHSSs, PACs and UBCs.

Describe methods in which spills were mitigated, if any:

Spills were cleaned up to the standards of the day.

Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.): Isotopes of concern include but are not limited to plutonium, enriched uranium, and depleted uranium. No pure beta emitters or mixed fission products are not known to have been handled in any of the facilities addressed in this HSA. Building 991 has several sealed radioactive sources that are stored and routinely used in the facility. These sealed sources are stored in five different locations in Building 991. The sealed radioactive sources include Pu-238, Pu-239, Cf-252, Cs-137, Sr-90, Ir-192, and Eu-152. None of the sealed sources were known to have leaked.

Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):

See "Environmental Restoration Concerns" section below.

Environmental Restoration Concerns

Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):

~~Building 991 has UBC-991 which includes Buildings 991, 996, 997, 998, and Building 999 that historically had a lot of~~ different materials and components stored and assembled in them.

Building 991/992 has PAC 900-184, a Steam Cleaning Area for radioactively-contaminated equipment and drums, that is an area of concern.

Building 991 has PAC 900-173 South Dock Area, Building 991 and the associated Buildings 996, 997, 998, and 999, incidents involving very small quantities of plutonium, uranium, and beryllium. Small spills likely occurred in these areas and small parts and equipment were washed in the Building 991 dock area.

Building 991 has PAC 900-1301, enclosed 50 feet wide along the south side of storage of various radioactive contaminated waste and materials is an area of concern.

Building 991 has PAC 900-1302, Gasoline Spill, NFA Recommendation approved by EPA, 1992[4].

Building 991 has PAC 900-1303, Natural Gas Leak, NFA Recommendation approved by EPA, 1992[4].

Building 991 has PAC 900-1304, Chromic Acid Spill, NFA Recommendation approved by EPA, 1992[4].

Building 991 has PAC 900-1305, Building 991 Roof, NFA Recommendation approved by EPA, 1992[4].

Building 991 has PAC 900-1306, Transformers 991-1 and 991-2, Recommended for NFA in 1996 HRR Annual Update.

Building 993 has PAC 900-1307 because of an Explosive Forming/Bonding Pit experiments. These experiments involve the use of dynamite to bond depleted uranium alloys with stainless steel.

29

Additional Information

Describe any additional information that may be useful during facility characterization (e.g., contaminant migration routes, waste handling operations, physical hazards, Historical Release Reports, WSRIC data, etc.):

The Building 991 Cluster has several PACs that are listed in the RFETS Historical Release Reports. Buildings 991and 985 both have a WSRIC.

References

Provide all sources of information utilized to gather data for facility history (e.g., documents, files, interviews). Attach all applicable supporting documentation.

Sources reviewed to complete this HSA were the RFETS Facility list, the Historical Release Report, the Listing of Beryllium Areas Historical and Present, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases. Building 991 has a Facility Safety Analysis Report (FSAR). Building 991and Building 985 both have a WSRIC. In addition, a facility walkdown of all Building 991 Cluster Facilities was performed. The Configuration Control Authority for Building 991was interviewed for Type 1 Facilities and Type 2 Facilities and he was very familiar with every one of them as to current configuration and use, but he knew very little about historical operations.

Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 991, Type 2

Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
83,320	500	6,000	2,500	3,500	TBD	1,800 Transite® cu ft wall panels 12,000 cu ft BUR, (possibly ACM) 500 cu ft floor tile, (possibly ACM) 2,000 cu ft ceiling tile, (possibly ACM) 2,500 cu ft pipe insulation (possibly ACM)

Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 984, Type 1

Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
14,500	None	2,600	7,500	None	TBD	5,000 Cu ft wall/roof insulation

Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 985, Type 1

Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)

30

18,000	None	980	None	None	TBD	900 cu ft pipe Insulation 400 cu ft fiberglass insul. 600 cu ft asbestos membrane roofing material
Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 989, Type 1						
Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
3,200	None	240	None	None	TBD	60 cu ft pipe insulation
Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, 991TUN, Type 2						
Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
37,000	None	2,500	None	None	TBD	None
Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 992, Type 1						
Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
2,500	None	1,200	None	300	TBD	400 cu ft window Glass 4 cu ft Mercury Vapor Lights 60 cu ft pipe insulation 200 cu ft wall/ceiling insul
Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 993, Type 1						
Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
5,000	30	800	3,500	None	TBD	30 cu ft window Glass 4 cu ft Mercury Vapor Lights
Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 996, Type 2						
Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
55,000	600	120	None	None	TBD	None

31

Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991Cluster, Building 997, Type 1

Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
55,000	600	120	None	None	TBD	None

Further Actions

Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):

Begin the RLC/PDS process.

Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991 Facilities, Building 998, Type 2

Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
31,200	None	20	None	None	TBD	None

Waste Volume Estimates and Material Types For Area 2 – Group 2, Building 991Cluster, Building 999, Type 1

Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste (cu ft)
28,800	None	20	None	None	TBD	None

Further Actions

Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):

Begin the RLC/PDS process.

Note:

This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. SMEs should evaluate and/or verify all information during the RLC/PDS process. SMEs may need to review additional documentation and perform additional interviews. Information contained in this HSA Report only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this HSA Report will not be amended. The RLC data will take precedence over the information in this HSA Report. RLC data will appear in the RLCR/PDSR.

Prepared By: Bob Sheets (Name) — Doug Bryant, for Bob Sheets (Signature) — 5-7-02 (Date)

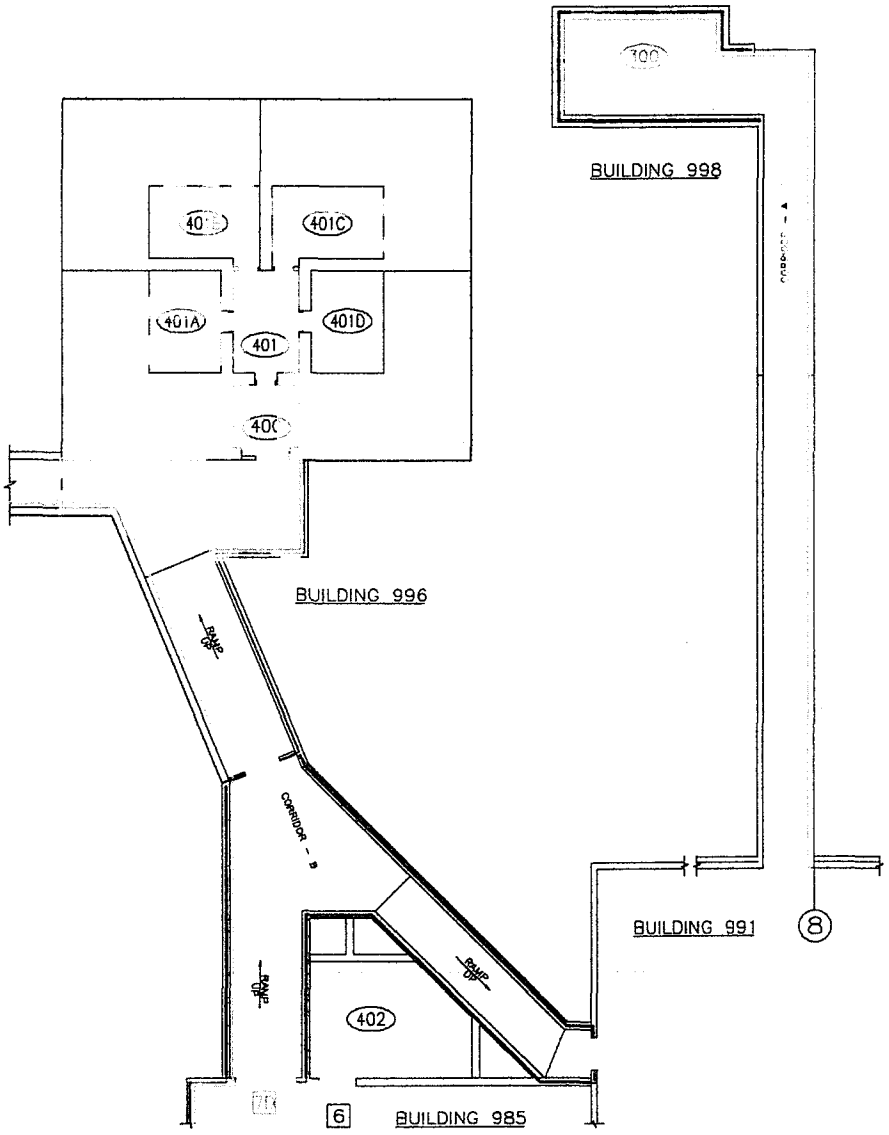
32

ATTACHMENT C

Radiological Data Summaries and Survey Maps

PRE-DEMOLITION SURVEY FOR BUILDING 991

Survey Area: N/A **Survey Unit: N/A** **Classification: 3**
Building: 991 - Type 2
Survey Unit Description: Inaccessible Storage Areas
Total Area: N/A sq. m. **Total Floor Area: N/A sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit
- Inaccessible Drum Storage Areas

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s): _____

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/991-INACC-1 Sept. 16, 2002

34

ATTACHMENT C-1

SURVEY AREA - A

Radiological Data Summary and Survey Maps

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	394
Cal Due	10/30/02	Cal Due	10/29/02	Cal Due	1/12/03
Bkg	0.2 cpmα	Bkg	0.5 cpmα	Bkg	3 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.60 %
MDA	20 dpmα	MDA	20 dpmα	MDA	48 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	394
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	1/12/03
Bkg	31.5 cpmβ	Bkg	34.1 cpmβ	Bkg	1132 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	30.10 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	529 dpmβ

Survey Type: Contamination
Building: 991
Location: Area A WF 1-32
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/18/02 Time: 1500

RCT: S. Voorhies /S. Voorhies/ [redacted]
Print name Signature

RCT: B. Gallagher /B. Gallagher/
Print name Signature Emp. #

PRN/REN #: N/A
Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	3	4	22	0
2	See map for location	0	0	18	0
3	See map for location	0	44	0	395
4	See map for location	3	4	0	1150
5	See map for location	0	0	49	5332
6	See map for location	3	4	13	12990
7	See map for location	3	0	44	125249
8	See map for location	6	0	71	16860
9	See map for location	0	0	66	19206
10	See map for location	3	32	9	8422
11	See map for location	0	8	40	24658
12	See map for location	0	0	80	22458
13	See map for location	0	20	66	114618
14	See map for location	3	20	33	76744
15	See map for location	3	12	84	30110
16	See map for location	3	4	40	14040
17	See map for location	0	36	66	184718
18	See map for location	3	48	18	19555
19	See map for location	0	0	31	6289
20	See map for location	3	8	102	45515
21	See map for location	3	12	93	47176
22	See map for location	0	4	93	94352
23	See map for location	3	0	111	72425
24	See map for location	0	0	35	20040
25	See map for location	3	0	9	0

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
26	See map for location	0	16	13	12864
27	See map for location	0	24	4	5455
28	See map for location	0	16	13	24814
29	See map for location	3	0	13	25110
30	See map for location	0	4	0	16960
31	See map for location	0	20	4	41528
32	See map for location	0	0	20	8970

Elevated Beta counts were do to drum storage in the area.

Date Reviewed: 8-6-02 **RS Supervision:** Teresa Johnston Teresa Johnston [redacted]
Print Name Signature

RADIOLOGICAL SAFETY

Scan Investigation Sheet

991 Area A WF 1-32 Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

Location

	dpmα	dpmβ		dpmα	dpmβ
1	<225	<11250	26	<225	**13355**
2	<225	<11250	27	<225	<11250
3	<225	<11250	28	<225	**31561**
4	<225	<11250	29	<225	**31561**
5	<225	**12625**	30	<225	**19934**
6	<225	**12787**	31	<225	**55482**
7	<225	**141196**	32	<225	<11250
8	<225	**13475**			
9	<225	**16551**			
10	<225	<11250			
11	<225	**18173**			
12	<225	**22757**			
13	<225	**123920**			
14	<225	**83056**			
15	<225	**29166**			
16	<225	**15322**			
17	<225	**192691**			
18	<225	**25355**			
19	<225	<11250			
20	<225	**40199**			
21	<225	**47508**			
22	<225	**109967**			
23	<225	**73754**			
24	<225	**19389**			
25	<225	<11250			

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	394
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	1/12/03
Bkg	0.2 cpmα	Bkg	0.3 cpmα	Bkg	2 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.60 %
MDA	20 dpmα	MDA	20 dpmα	MDA	41 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	835	Serial #	394
Cal Due	10/30/02	Cal Due	7/16/03	Cal Due	1/12/03
Bkg	30 cpmβ	Bkg	32 cpmβ	Bkg	368 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	30.10 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	305 dpmβ

Survey Type: Contamination
Building: 991
Location: Area A WF 33-45
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/26/02 Time: 1000

RCT: S. Voorhies /S.Voorhies / [redacted]
Print name Signature Emp. #

RCT: NA / NA /NA
Print name Signature Emp. #

PRN/REN # : N/A
Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2.

SURVEY RESULTS

Elevated Beta counts were do to drum storage in the area.

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
33	See map for location	0	0	40	6086
34	See map for location	0	0	13	6146
35	See map for location	3	0	18	7100
36	See map for location	0	0	66	6658
37	See map for location	0	0	22	7615
38	See map for location	3	0	58	31362
39	See map for location	0	0	35	9010
40	See map for location	3	60	18	44518
41	See map for location	0	32	62	25777
42	See map for location	0	48	35	13359
43	See map for location	0	12	13	4193
44	See map for location	0	0	9	2040
45	See map for location	0	8	22	3671

Date Reviewed: 8-6-02 **RS Supervision:** [redacted]
Print Name Signature Emp. #

40

RADIOLOGICAL SAFETY

Scan Investigation Sheet

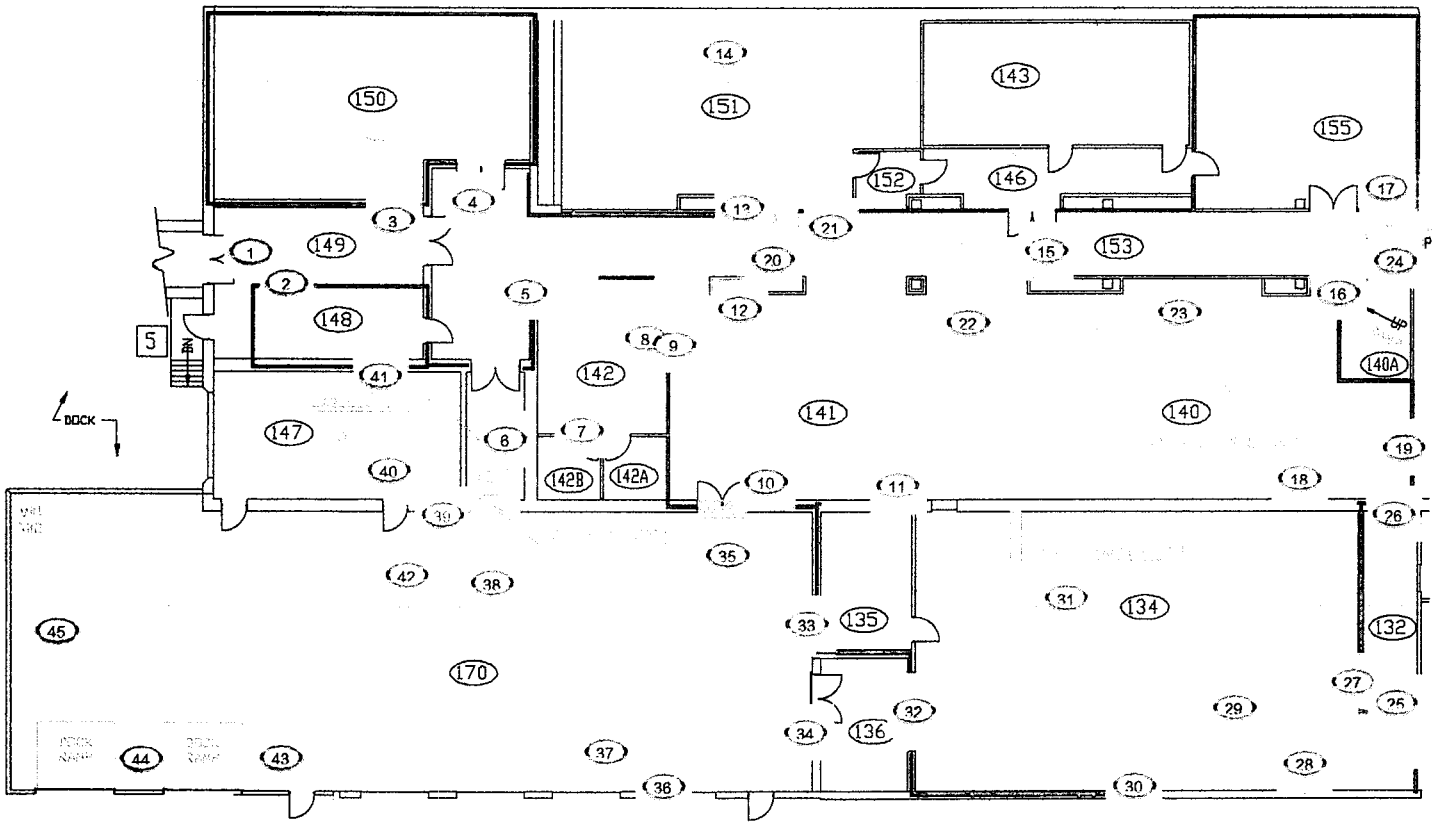
991 Area A WF 33-45 Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

Location	dpmα	dpmβ
33	<225	<11250
34	<225	<11250
35	<225	<11250
36	<225	<11250
37	<225	<11250
38	<225	**29040**
39	<225	<11250
40	<225	**49834**
41	<225	**26262**
42	<225	<11250
43	<225	**14764**
44	<225	<11250
45	<225	<11250

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: A **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: <2m Floor & Walls
Total Area: N/A sq. m. **Total Floor Area: 1472 sq. m.**



Scan Area

SURVEY MAP LEGEND	Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.	N	0 FEET 0 0 METERS 0	U.S. Department of Energy Rocky Flats Environmental Technology Site
(#) Smear & TSA Location (#) Smear, TSA & Sample Location Open/Inaccessible Area Area in Another Survey Unit	**Scan Survey Information** **Survey Instrument ID #(s):** N/A **RCT ID #(s):** N/A			Prepared by: GIS Dept. 303-966-7707 Prepared for: DynCorp THE ART OF TECHNOLOGY KAISER-HILL MAP ID: 02-0355/991A-FW-SC August 28, 2002

42

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1260
Cal Due	10/30/02	Cal Due	10/29/02	Cal Due	8/27/02
Bkg	0.2 cpmα	Bkg	0.5 cpmα	Bkg	3 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.10 %
MDA	20 dpmα	MDA	20 dpmα	MDA	49 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1260
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	8/27/02
Bkg	31.5 cpmβ	Bkg	34.1 cpmβ	Bkg	753 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.70 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	439 dpmβ

Survey Type: Contamination
Building: 991
Location: Area A WC
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/18/02 Time: 1500

RCT: S. Voorhies / S. Voorhies [redacted]
Print name Signature

RCT: NA / NA / NA
Print name Signature Emp. #

PRN/REN # : N/A

Comments: Survey on walls at height >2 meters and ceiling where possible. Areas above investigation limits of 225α and 11250B were scanned.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	0	0	0	108
2	See map for location	0	0	23	4202
3	See map for location	0	8	27	10660
4	See map for location	0	0	14	8808
5	See map for location	0	12	41	23121
6	See map for location	0	0	27	19586
7	See map for location	0	8	32	21168
8	See map for location	0	0	14	5152
9	See map for location	3	0	32	4461
10	See map for location	6	24	5	2791
11	See map for location	0	40	5	4737
12	See map for location	0	0	0	660
13	See map for location	0	4	9	4172
14	See map for location	3	28	41	3212
15	See map for location	0	0	0	0

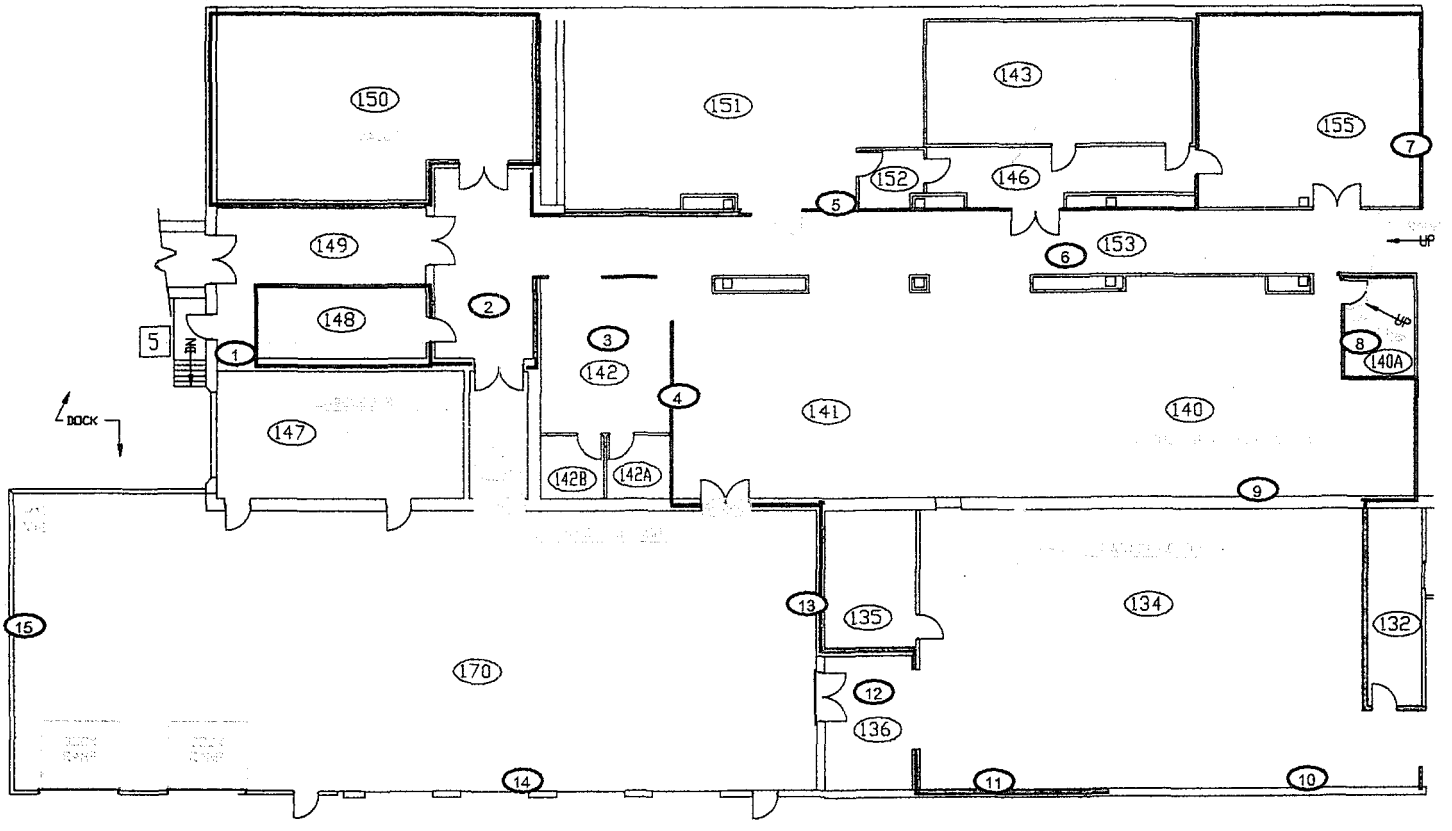
Elevated Beta counts were do to drum storage in the area.

Date Reviewed: 8-6-02 **RS Supervision:** [redacted]
Print Name Signature Emp. #

AB

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: A **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: >2m Ceiling & Walls
Total Area: N/A sq. m. **Total Floor Area: 1472 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DO NOT SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

MAP ID: 02-0355/991A-CW August 28, 2002

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1250
Cal Due	10/30/02	Cal Due	10/29/02	Cal Due	10/10/02
Bkg	0.2 cpmα	Bkg	0.5 cpmα	Bkg	5 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.60 %
MDA	20 dpmα	MDA	20 dpmα	MDA	61 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1250
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	10/10/02
Bkg	31.5 cpmβ	Bkg	34.1 cpmβ	Bkg	735 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	28.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	455 dpmβ

Survey Type: Contamination
Building: 991
Location: Area A Equip 1-36
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/18/02 **Time:** 1500

RCT:	Print name	Signature	Emp. #
	S. Voorhies	/S. Voorhies/	[redacted]
RCT:	NA	NA	NA

PRN/REN #: N/A
Comments: Survey on various pieces of equipment.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	Trash Can	3	0	5	2622
2	Elect. Panel # AP-34	0	24	9	2961
3	Emer. Light panel	0	0	32	5633
4	Camera Box	0	0	65	12064
5	Elect. Panel	0	28	28	0
6	Elect. Panel	0	16	9	0
7	Control transfer panel	3	0	14	4908
8	Emer. Light panel	0	6	0	8802
9	Door control panel	3	28	9	6385
10	Chalk board/desk	3	12	0	314
11	Chalk board	0	0	14	15163
12	Electrical outlet	0	0	5	12837
13	Drawing desk	0	0	51	25336
14	Cup Holder	0	32	28	30671
15	Supply cabinet	0	28	42	40636
16	Filter housing	3	0	28	43869
17	Power conditional frame	3	8	5	47375
18	Elect. Panel	0	0	42	42686
19	3 phase safety switch	3	0	9	24788
20	Elect. Panel	3	16	14	25159
21	Fire Extinguisher	0	0	0	8686
22	Standup desk	0	12	0	35053
23	Breaker box	0	0	32	34102
24	GE Transformer	0	32	0	30371
25	Fume hood	0	0	0	11219

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
26	Desk	0	0	0	6237
27	Cabinet	6	16	5	6042
28	Fireproof safe	0	60	0	544
29	File cabinet	3	0	0	364
30	Desk	3	0	0	710
31	Junction Box	0	8	0	2668
32	Large breaker panel	0	0	0	5420
33	Electrical panel	0	0	5	4413
34	Eye wash station	3	0	0	0
35	Circuit breaker box	0	36	0	1283
36	Desk	3	0	0	2845

Elevated Beta counts were do to drum storage in the area.

Date Reviewed: 8-6-02 **RS Supervision:** Teresa Johnston /Teresa Johnston/ [redacted]
Print Name Signature

45

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1250
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	10/10/02
Bkg	0.2 cpmα	Bkg	0.3 cpmα	Bkg	1 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	35 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	835	Serial #	1250
Cal Due	10/30/02	Cal Due	7/16/03	Cal Due	10/10/02
Bkg	30 cpmβ	Bkg	32 cpmβ	Bkg	365 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	28.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	323 dpmβ

Survey Type: Contamination
Building: 991
Location: Area A Equip 37-45
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/26/02 **Time:** 1000

RCT: S. Voorhies /S. Voorhies/ [redacted]
Print name Signature

RCT: B. Gallagher /Bill Gallagher/
Print name Signature Emp. #

PRN/REN #: N/A
Comments: Survey on various pieces of equipment.

SURVEY RESULTS

Scans were not required on this equipment. All 1 minute pats were less than the investigative limits
225 dpm α and 11250 dpm β.

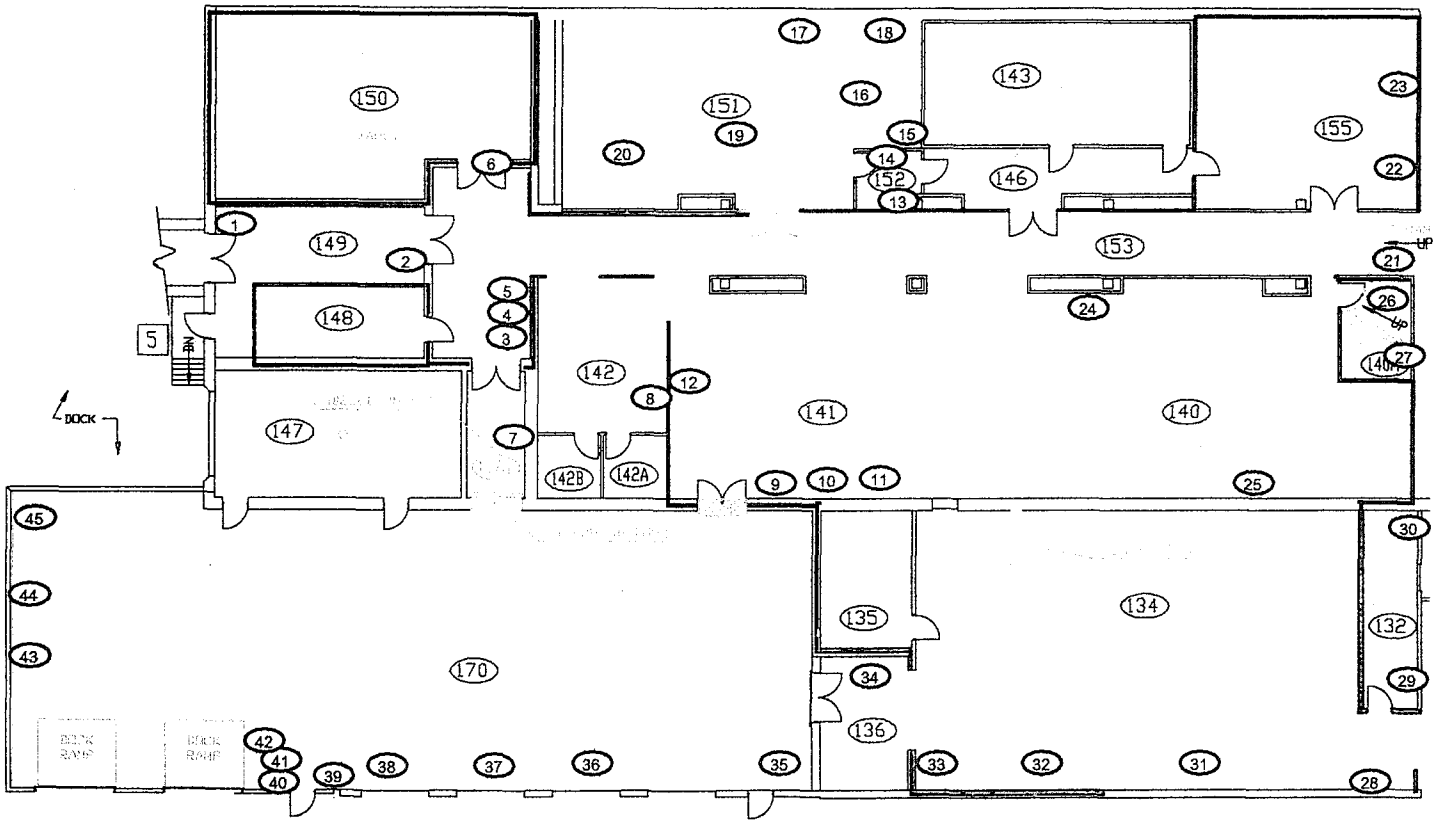
Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
37	Drum Lift Rm 170	0	8	21	5848
38	Desk Rm 170	3	0	9	3223
39	Fire Phone Rm 170	0	12	19	3675
40	Fire Extinguisher Rm 170	0	0	33	3216
41	Breaker Box	0	0	28	3124
42	Hydraulic dock plate Rm 170	0	40	38	2170
43	Workbench Rm 170	0	0	19	2240
44	Spill Cabinet Rm 170	0	0	9	6661
45	Fire Supression sys. Rm 170	0	0	33	4664

Date Reviewed: 8-6-02 **RS Supervision:** Teresa Thurston /Teresa Thurston/ [redacted]
Print Name Signature

4/6

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: A **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: Equipment Location
Total Area: N/A sq. m. **Total Floor Area: 1472 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/991A-EQ August 28, 2002

47

ATTACHMENT C-2

SURVEY AREA - B

Radiological Data Summary and Survey Maps

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1250
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	10/10/02
Bkg	0.1 cpmα	Bkg	0.1 cpmα	Bkg	1 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	35 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1250
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	10/10/02
Bkg	32 cpmβ	Bkg	36 cpmβ	Bkg	619 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	28.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	418 dpmβ

Survey Type: Contamination
Building: 991
Location: Area B WF
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/16/02 Time: 1300

RCT: S. Voorhies /S.Voorhies [redacted]
Print name Signature

RCT: J.B. Abney J B Abney
Print name Signature

PRN/REN # : N/A
Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	0	36	0	0
2	See map for location	0	4	0	166
3	See map for location	0	4	14	396
4	See map for location	0	0	0	332
5	See map for location	3	36	14	92
6	See map for location	0	0	0	0
7	See map for location	0	8	5	0
8	See map for location	0	0	19	239
9	See map for location	0	12	0	194
10	See map for location	0	20	9	403
11	See map for location	0	0	0	0
12	See map for location	0	0	9	263
13	See map for location	3	0	9	0
14	See map for location	0	28	0	286
15	See map for location	3	0	70	675
16	See map for location	0	24	0	675
17	See map for location	0	0	5	371
18	See map for location	3	0	9	44
19	See map for location	0	0	14	191
20	See map for location	0	0	14	283
21	See map for location	3	16	5	0
22	See map for location	3	0	9	0
23	See map for location	0	0	33	244
24	See map for location	0	0	9	0
25	See map for location	0	0	5	0

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
26	See map for location	0	0	5	64
27	See map for location	3	8	19	311
28	See map for location	0	0	28	143
29	See map for location	0	4	33	0
30	See map for location	0	12	5	141

Date Reviewed: 7-16-02 **RS Supervision:** Jessie Johnston /Jessie Johnston [redacted]
Print Name Signature

50

RADIOLOGICAL SAFETY

Scan Investigation Sheet

991 Area B WF Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

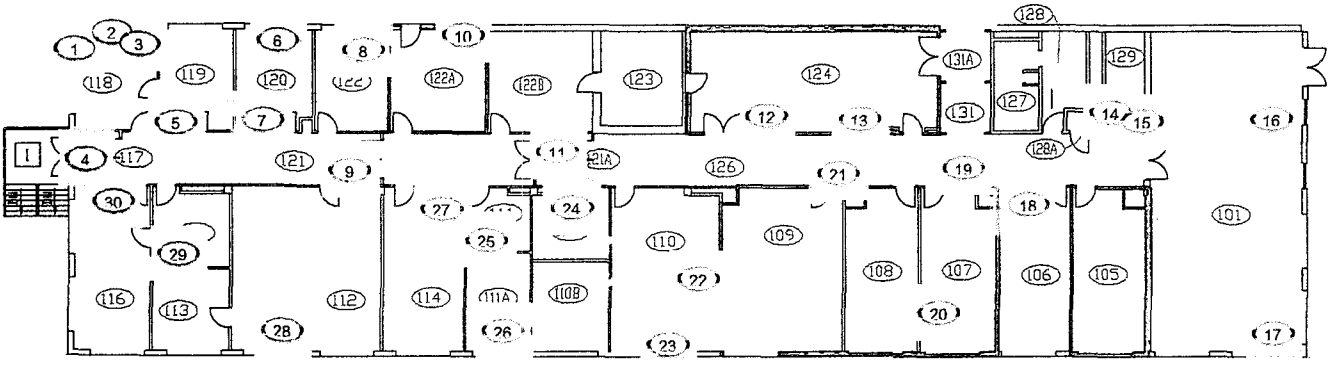
Location

	dpmα	dpmβ		dpmα	dpmβ	dpmα	dpmβ
1	<225	<11250	26	<225	<11250		
2	<225	<11250	27	<225	<11250		
3	<225	<11250	28	<225	<11250		
4	<225	<11250	29	<225	<11250		
5	<225	<11250	30	<225	<11250		
6	<225	<11250					
7	<225	<11250					
8	<225	<11250					
9	<225	<11250					
10	<225	<11250					
11	<225	<11250					
12	<225	<11250					
13	<225	<11250					
14	<225	<11250					
15	<225	<11250					
16	<225	<11250					
17	<225	<11250					
18	<225	<11250					
19	<225	<11250					
20	<225	<11250					
21	<225	<11250					
22	<225	<11250					
23	<225	<11250					
24	<225	<11250					
25	<225	<11250					

51

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: B **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: <2m Floor & Walls
Total Area: N/A sq. m. **Total Floor Area: 934 sq. m.**



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0355/991B-FW-SC August 28, 2002

52

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1379
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	11/20/02
Bkg	0.1 cpmα	Bkg	0.1 cpmα	Bkg	1 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	17.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	43 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1379
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	11/20/02
Bkg	32 cpmβ	Bkg	36 cpmβ	Bkg	784 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	454 dpmβ

Survey Type: Contamination
Building: 991
Location: Area B WC
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/16/02 Time: 1300

RCT: A. Munoz [signature] [redacted]
Print name Signature

RCT: P. Vestal [signature]
Print name Signature Emp. #

PRN/REN # : N/A

Comments: Survey on walls at height >2 meters and ceiling where possible. Areas above investigation limits of 225α and 11250B were scanned.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	See map for location	3	0	23	0
2	See map for location	0	12	40	10
3	See map for location	0	0	35	502
4	See map for location	0	0	35	0
5	See map for location	3	12	46	307
6	See map for location	0	0	17	758
7	See map for location	0	2	23	0
8	See map for location	3	0	12	0
9	See map for location	0	16	40	0
10	See map for location	3	8	23	754

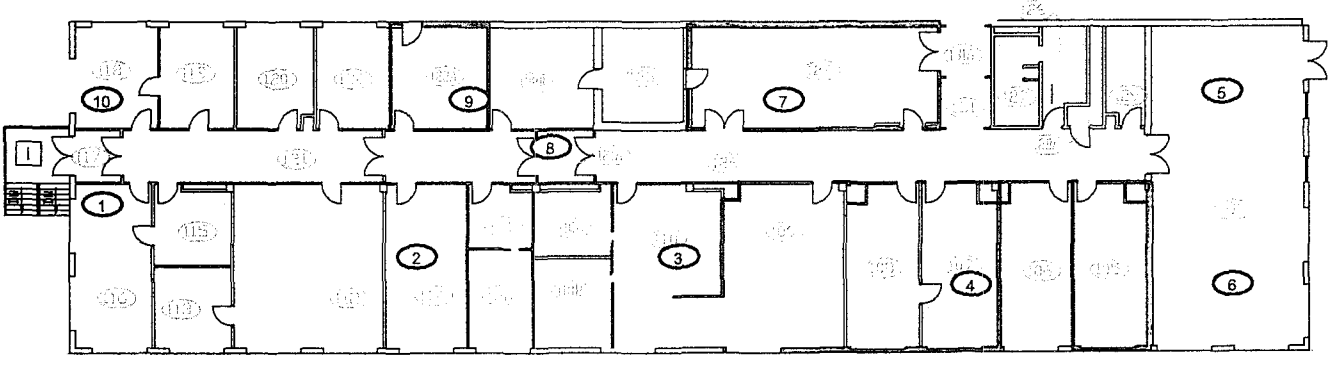
Scans were not required on these locations. All 1 minute pats were less than the investigative limits 225 dpm α and 11250 dpm β.

Date Reviewed: 7-16-02 **RS Supervision:** Teresa Johnston [signature] [redacted]
Print Name Signature

53

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: B **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: >2m Ceiling & Walls
Total Area: N/A sq. m. **Total Floor Area: 934 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0355/991B-CW July 31, 2002

54

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1420
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	9/27/02
Bkg	0.1 cpmα	Bkg	0.1 cpmα	Bkg	0 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	12 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1420
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	9/27/02
Bkg	32 cpmβ	Bkg	36 cpmβ	Bkg	631 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	32.50 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	368 dpmβ

Survey Type: Contamination
Building: 991
Location: Area B Equip
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/16/02 Time: 1300

RCT: A. Conley [signature] [redacted]
Print name Signature

RCT: M. Givens [signature]
Print name Signature

PRN/REN # : N/A
Comments: Survey on various pieces of equipment. Scans were performed on locations with elevated readings.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	Elect. Panel Rm 101	3	0	4	0
2	Shelf Rm 101	3	12	27	249
3	Elect. Panel Rm 129	0	0	13	175
4	Sink Rm 128A	0	0	13	0
5	Cabinet Rm 105	0	0	9	0
6	Access panel Rm 131A	0	52	13	308
7	Desk Rm 124	0	20	13	0
8	Desk Rm 107	3	6	13	0
9	Storage Cabinet Rm 107	0	0	9	0
10	Cooling Water panel Rm 126	0	0	9	0
11	Emer. Light Rm 123	0	12	13	0
12	Cabinet Rm 123	3	0	22	185
13	Safe Rm 122B	0	0	9	71
14	Cabinet Rm 111A	0	24	9	71
15	Fire King cabinet Rm 111	0	36	13	385
16	File Cabinet Rm 110	0	28	9	708
17	Hardness tester Rm 110	0	32	18	351
18	Bottle Rack Rm 110B	0	24	18	332
19	Paper towel holder Rm 110A	3	56	13	178
20	Elect. Panel Rm 126	0	0	27	622
21	Bookshelf Rm 122A	0	0	9	1105
22	Heater Rm 114	6	20	9	594
23	Desk Rm 112	0	24	4	551
24	Corkboard Rm 124	3	0	31	926
25	File Cabinet Rm 120	0	0	4	1071

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
26	Elect. Cabinet Rm 121	0	0	13	422
27	Lockbox Rm 119	0	20	18	1366
28	Overhead bins Rm 115	0	28	4	203
29	Desk Rm 116	0	0	27	0
30	Microwave Stand Rm 118	3	12	18	0

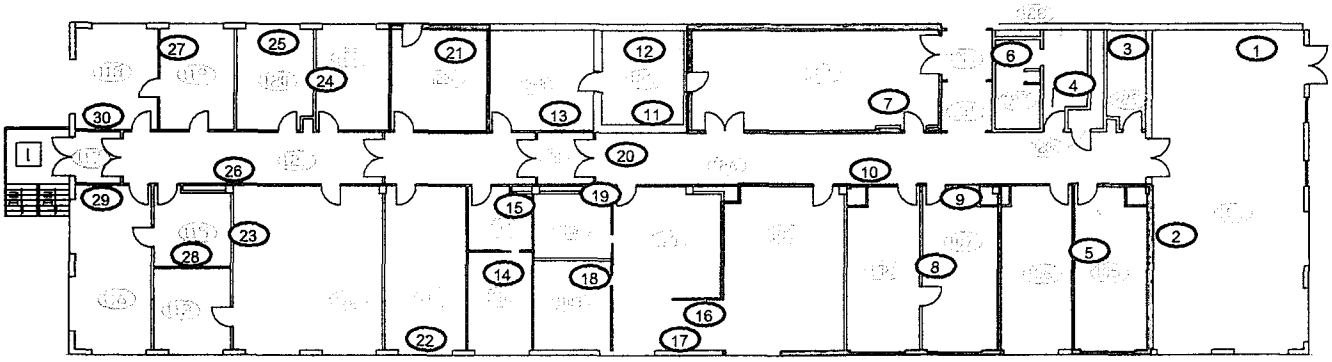
Scans were not required on this equipment. All 1 minute pats were less than the investigative limits 225 dpm α and 11250 dpm β.

Date Reviewed: ~~7-16-02~~ 7-16-02 **RS Supervision:** Teresa Johnston [signature] [redacted]
Print Name Signature

55

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: B **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: Equipment Location
Total Area: N/A sq. m. **Total Floor Area: 934 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/991B-EQ

April 9, 2002

54

ATTACHMENT C-3

SURVEY AREA - C

Radiological Data Summary and Survey Maps

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1250
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	10/10/02
Bkg	0.2 cpmα	Bkg	0.3 cpmα	Bkg	1 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	35 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	835	Serial #	1250
Cal Due	10/30/02	Cal Due	7/16/03	Cal Due	10/10/02
Bkg	30 cpmβ	Bkg	32 cpmβ	Bkg	365 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	28.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	323 dpmβ

Survey Type: Contamination
Building: 991
Location: Area C WF
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/26/02 Time: 0900

RCT: J. Absher [signature] [redacted]
Print name Signature

RCT: J. B. Abney [signature] [redacted]
Print name Signature Emp. #

PRN/REN # : N/A

Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2. High reading @ spot 13 near drum storage

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	See map for location	0	16	92	3124
2	See map for location	0	0	26	3420
3	See map for location	0	8	26	3360
4	See map for location	0	0	31	2382
5	See map for location	0	0	28	2700
6	See map for location	3	8	28	2608
7	See map for location	0	12	94	3777
8	See map for location	0	8	63	2396
9	See map for location	0	20	28	3180
10	See map for location	0	20	75	2915
11	See map for location	0	0	33	3954
12	See map for location	0	56	35	3155
13	See map for location	0	40	47	31049
14	See map for location	3	0	33	4124
15	See map for location	3	0	19	4205
16	See map for location	0	20	33	2689
17	See map for location	0	24	33	2806
18	See map for location	0	4	33	3244
19	See map for location	0	0	40	2360
20	See map for location	0	24	23	3417
21	See map for location	3	32	52	2339
22	See map for location	9	40	5	~~31484~~ 2862
23	See map for location	0	0	42	2996
24	See map for location	0	0	28	2385
25	See map for location	0	0	23	1869

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
26	See map for location	0	0	5	2254
27	See map for location	0	0	14	3452
28	See map for location	0	0	23	3223
29	See map for location	0	0	0	1505
30	See map for location	0	4	19	1883

SDV 9/12/02

Date Reviewed: 8-6-02 **RS Supervision:** Teresa Johnston [signature] [redacted]
Print Name Signature Emp. #

59

RADIOLOGICAL SAFETY

Scan Investigation Sheet

991 | Area C WF | Reconnaissance Level Characterization

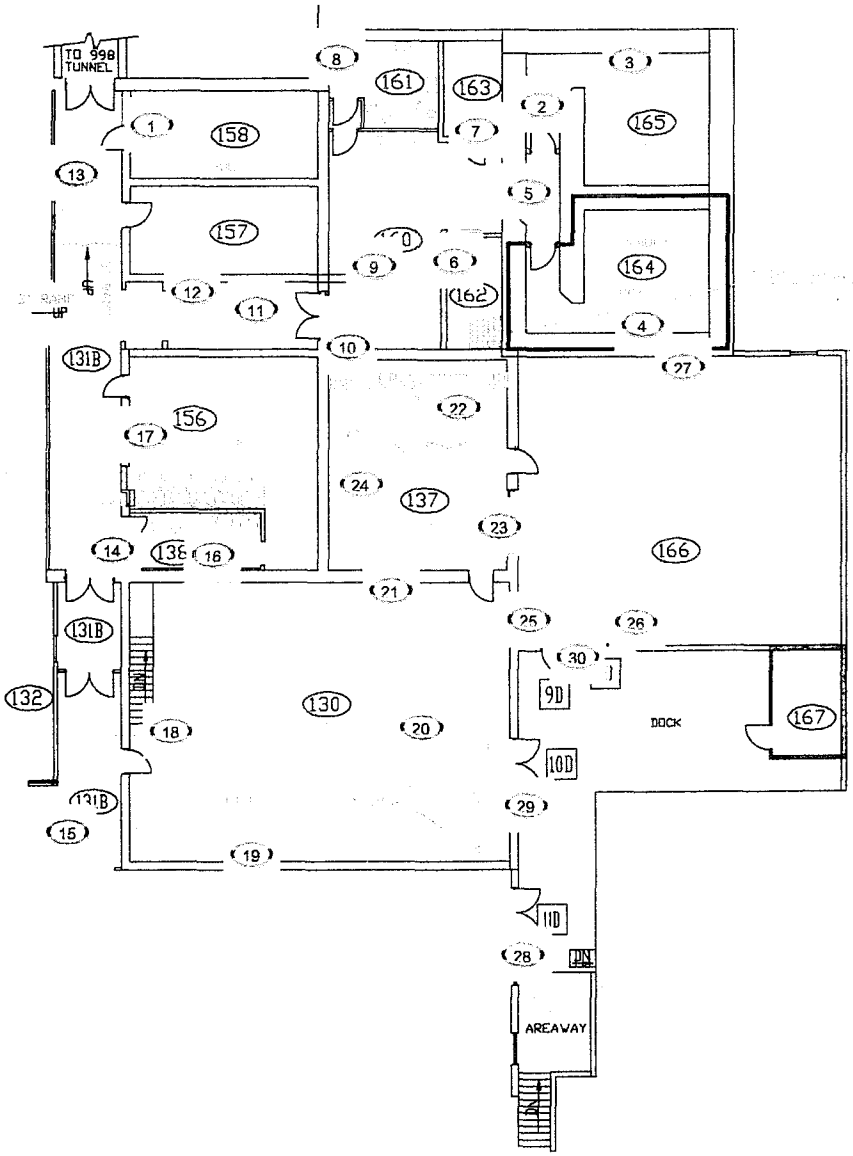
All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

Location	dpmα	dpmβ	Location	dpmα	dpmβ
1	<225	<11250	26	<225	<11250
2	<225	<11250	27	<225	<11250
3	<225	<11250	28	<225	<11250
4	<225	<11250	29	<225	<11250
5	<225	<11250	30	<225	<11250
6	<225	<11250			
7	<225	<11250			
8	<225	<11250			
9	<225	<11250			
10	<225	<11250			
11	<225	<11250			
12	<225	<11250			
13	<225	**30565**			
14	<225	<11250			
15	<225	<11250			
16	<225	<11250			
17	<225	<11250			
18	<225	<11250			
19	<225	<11250			
20	<225	<11250			
21	<225	<11250			
22	<225	<11250			
23	<225	<11250			
24	<225	<11250			
25	<225	<11250			

60

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: C **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: <2m Floor & Walls
Total Area: N/A sq. m. **Total Floor Area: 889 sq. m.**



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0355/991C-FW-SC August 28, 2002

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1241
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	8/26/02
Bkg	0.2 cpmα	Bkg	0.3 cpmα	Bkg	0 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.70 %
MDA	20 dpmα	MDA	20 dpmα	MDA	12 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	835	Serial #	1241
Cal Due	10/30/02	Cal Due	7/16/03	Cal Due	8/26/02
Bkg	30 cpmβ	Bkg	32 cpmβ	Bkg	257 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.60 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	261 dpmβ

Survey Type: Contamination
Building: 991
Location: Area C WC
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/26/02 Time: 1300

RCT: S. Voorhies /S. Voorhies/ [redacted]
Print name Signature

RCT: B. Gallagher /Bill Gallagher/
Print name Signature

PRN/REN # : N/A

Comments: Survey on walls at height >2 meters and ceiling where possible. Areas above investigation limits of 225α and 11250B were scanned.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	0	0	78	9412
2	See map for location	3	0	14	1791
3	See map for location	0	24	18	2287
4	See map for location	0	0	18	2051
5	See map for location	0	20	18	5432
6	See map for location	0	0	23	2152
7	See map for location	6	32	14	1949
8	See map for location	0	0	18	2287
9	See map for location	0	28	9	2277
10	See map for location	3	0	5	2152

Scans were not required in this area. All 1 minute pats were less than the investigative limits 225 dpm α and 11250 dpm β.

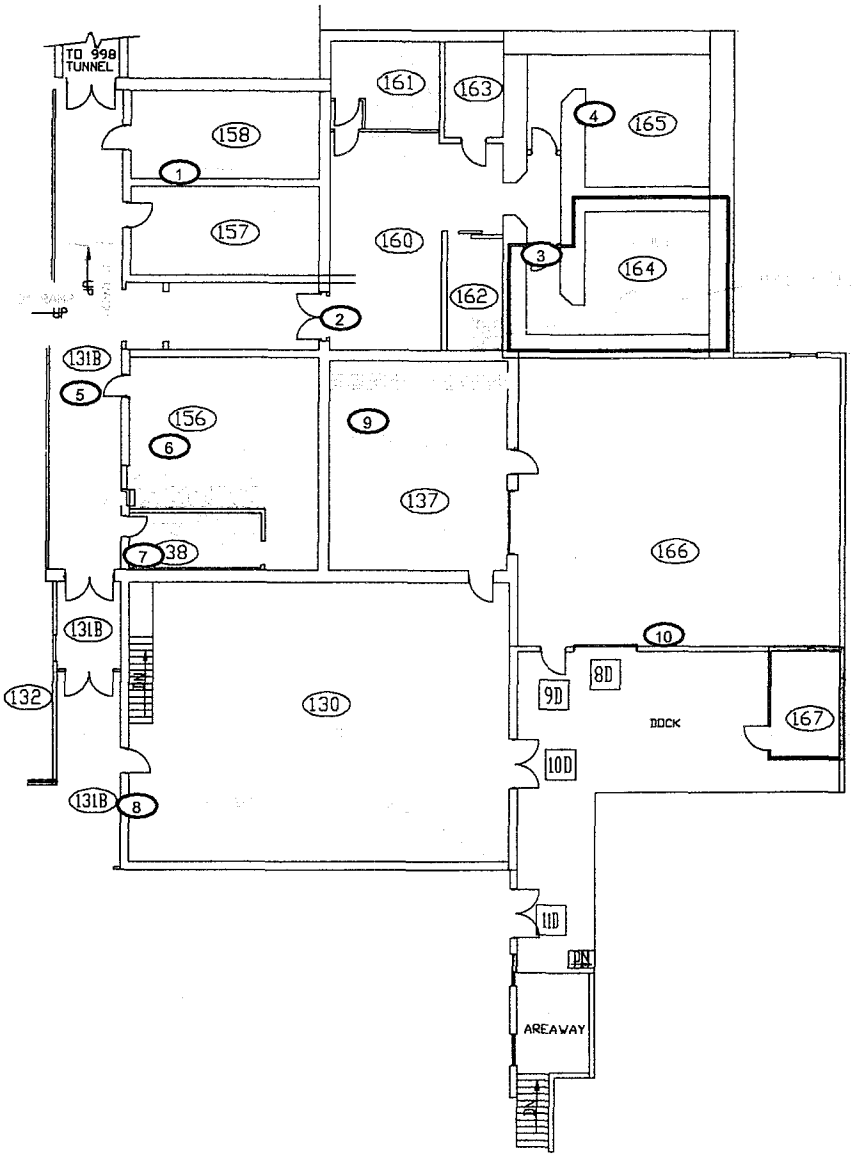
Locations 1 and 5 are elevated due to drum storage nearby. RCW 9/16/02

Date Reviewed: 8-6-02 **RS Supervision:** Teresa Johnston /Teresa Johnston/ [redacted]
Print Name Signature

62

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: C **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: >2m Ceiling & Walls
Total Area: N/A sq. m. **Total Floor Area: 889 sq. m.**



SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0355/991C-CW August 28, 2002

63

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1241
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	8/26/02
Bkg	0.2 cpmα	Bkg	0.3 cpmα	Bkg	0 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.70 %
MDA	20 dpmα	MDA	20 dpmα	MDA	12 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	835	Serial #	1241
Cal Due	10/30/02	Cal Due	7/16/03	Cal Due	8/26/02
Bkg	30 cpmβ	Bkg	32 cpmβ	Bkg	257 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.60 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	261 dpmβ

Survey Type: Contamination
Building: 991
Location: Area C Equip
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/26/02 Time: 1300

RCT: A. Munoz [signature] [redacted]
Print name Signature

RCT: J. B. Abney [signature] [redacted]
Print name Signature Emp. #

PRN/REN #: N/A
Comments: Survey on various pieces of equipment.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	Fire Extinguisher Rm. 166	0	0	28	1875
2	Fire Phone Rm 166	3	0	53	2351
3	Safety Switch Rm 166	0	0	23	1939
4	Plant air gauges Rm. 166	0	0	62	2953
5	Power Strip Rm 166	0	0	37	2034
6	Alarm box Rm 158	0	0	23	4726
7	Hot water heater Rm 137	0	8	35	1051
8	Pump Switch Rm 137	0	32	14	1584
9	Evap cooler unit Rm 130	0	0	23	1389
10	Air intake filter Rm 130	0	52	51	2111
11	Chiller unit Rm 130	6	0	18	1483
12	Telephone wire cab. Rm 130	12	4	83	2135
13	Plant air receiver Rm 130	3	0	23	1547
14	Filter bank Rm 130	3	20	51	2182
15	480V switch control Rm 130	0	0	37	1331
16	Speaker holder Rm 131B	0	4	23	4591
17	Locker # 39 Rm 138	3	28	18	2203
18	Locker Bench Rm 156	0	0	32	2750
19	Electric panel Rm 160	3	0	18	2003
20	Sink Rm 160	0	0	51	2257
21	Kodak film develop. Rm 160	6	16	23	2199
22	Sink Rm 161	0	0	14	2889
23	Exhaust Duct Rm 162	0	40	240	527
24	Bench Rm 164	6	0	46	2892
25	Shelf unit Rm 165	3	16	44	1997
26	AC Unit Rm 165	0	0	32	2199
27	Intake vent - dock	3	20	88	2284
28	Roll-up door - dock	0	32	46	2486
29	Flam. Cabinet - Dock	0	4	23	1297
30	Metal dock plate - dock	3	0	101	2250

Date Reviewed: 8-6-02 **RS Supervision:** [signature] [redacted]
Print Name Signature Emp. #

64

RADIOLOGICAL SAFETY

Scan Investigation Sheet

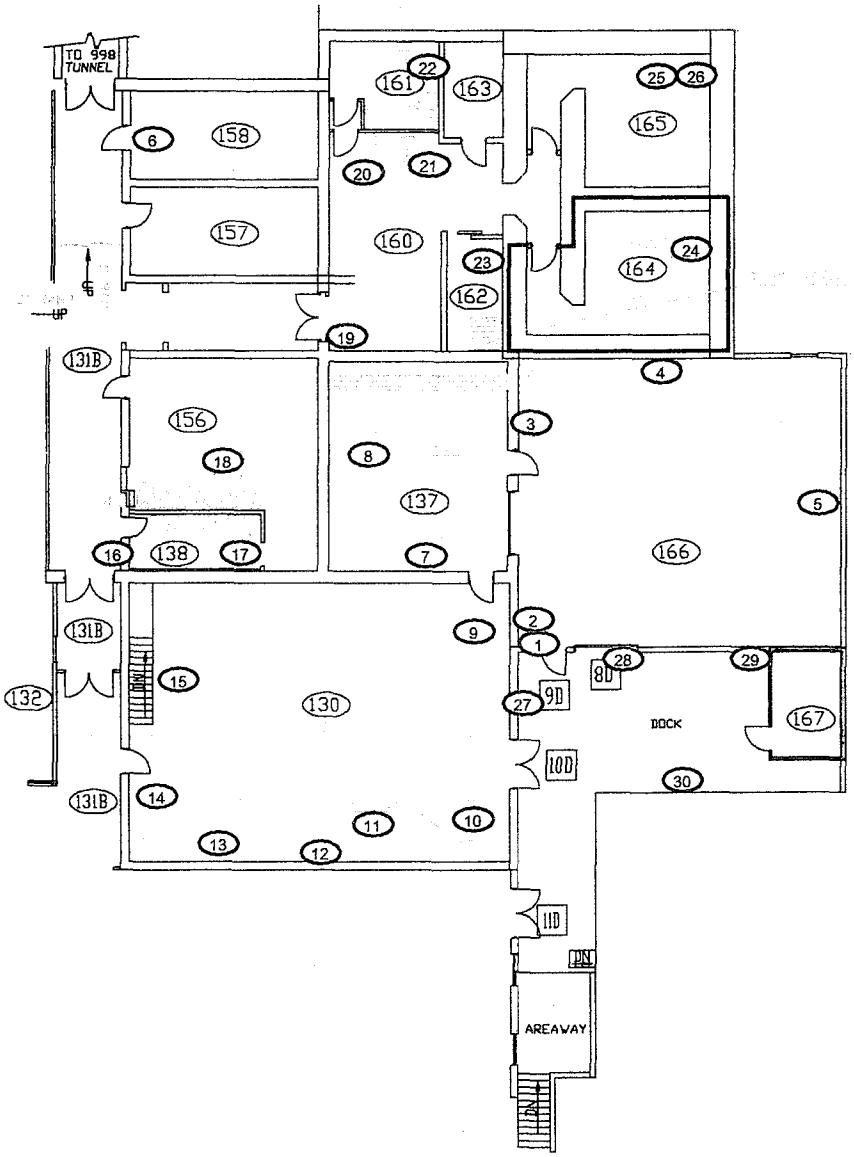
991 Area C Equip Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

Location	dpmα	dpmβ	Location	dpmα	dpmβ
1	N/A	N/A	26	N/A	N/A
2	N/A	N/A	27	N/A	N/A
3	N/A	N/A	28	N/A	N/A
4	N/A	N/A	29	N/A	N/A
5	N/A	N/A	30	N/A	N/A
6	N/A	N/A			
7	N/A	N/A			
8	N/A	N/A			
9	N/A	N/A			
10	N/A	N/A			
11	N/A	N/A			
12	N/A	N/A			
13	N/A	N/A			
14	N/A	N/A			
15	N/A	N/A			
16	N/A	N/A			
17	N/A	N/A			
18	N/A	N/A			
19	N/A	N/A			
20	N/A	N/A			
21	N/A	N/A			
22	N/A	N/A			
23	**415**	N/A			
24	N/A	N/A			
25	N/A	N/A			

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: C **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: Equipment Location
Total Area: N/A sq. m. **Total Floor Area: 889 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/991C-EQ August 28, 2002

66

ATTACHMENT C-4

SURVEY AREA - D

Radiological Data Summary and Survey Maps

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1420
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	9/21/02
Bkg	0 cpmα	Bkg	0.2 cpmα	Bkg	8 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	71 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1420
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	9/21/02
Bkg	36 cpmβ	Bkg	33 cpmβ	Bkg	779 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	32.50 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	408 dpmβ

Survey Type: Contamination
Building: 991
Location: Area D WF
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/17/02 Time: 0900

RCT: S. Voorhies /S. Voorhies/ [redacted]
Print name Signature

RCT: M. Givens /M. Givens/
Print name Signature

PRN/REN # : N/A
Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	3	0	0	745
2	See map for location	3	32	36	89
3	See map for location	3	72	40	486
4	See map for location	0	0	0	206
5	See map for location	0	8	22	255
6	See map for location	3	8	13	0
7	See map for location	0	32	58	228
8	See map for location	3	0	45	418
9	See map for location	0	0	13	335
10	See map for location	0	4	0	249
11	See map for location	0	0	31	98
12	See map for location	0	8	0	705
13	See map for location	0	8	36	231
14	See map for location	3	52	9	535
15	See map for location	3	36	27	77
16	See map for location	3	0	0	440
17	See map for location	0	4	63	320
18	See map for location	3	48	36	966
19	See map for location	3	0	0	542
20	See map for location	0	0	40	985
21	See map for location	0	16	0	1745
22	See map for location	9	20	18	760
23	See map for location	0	36	63	1668
24	See map for location	0	0	40	2382
25	See map for location	0	0	45	1382
26	See map for location	6	0	31	2034
27	See map for location	3	32	18	1382
28	See map for location	0	4	54	2092
29	See map for location	6	28	18	3526
30	See map for location	0	0	58	1778

Date Reviewed: 7-22-02 **RS Supervision:** Teresa Johnston /Teresa Johnston/ [redacted]
Print Name Signature

69

RADIOLOGICAL SAFETY

Scan Investigation Sheet

991 Area D WF Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

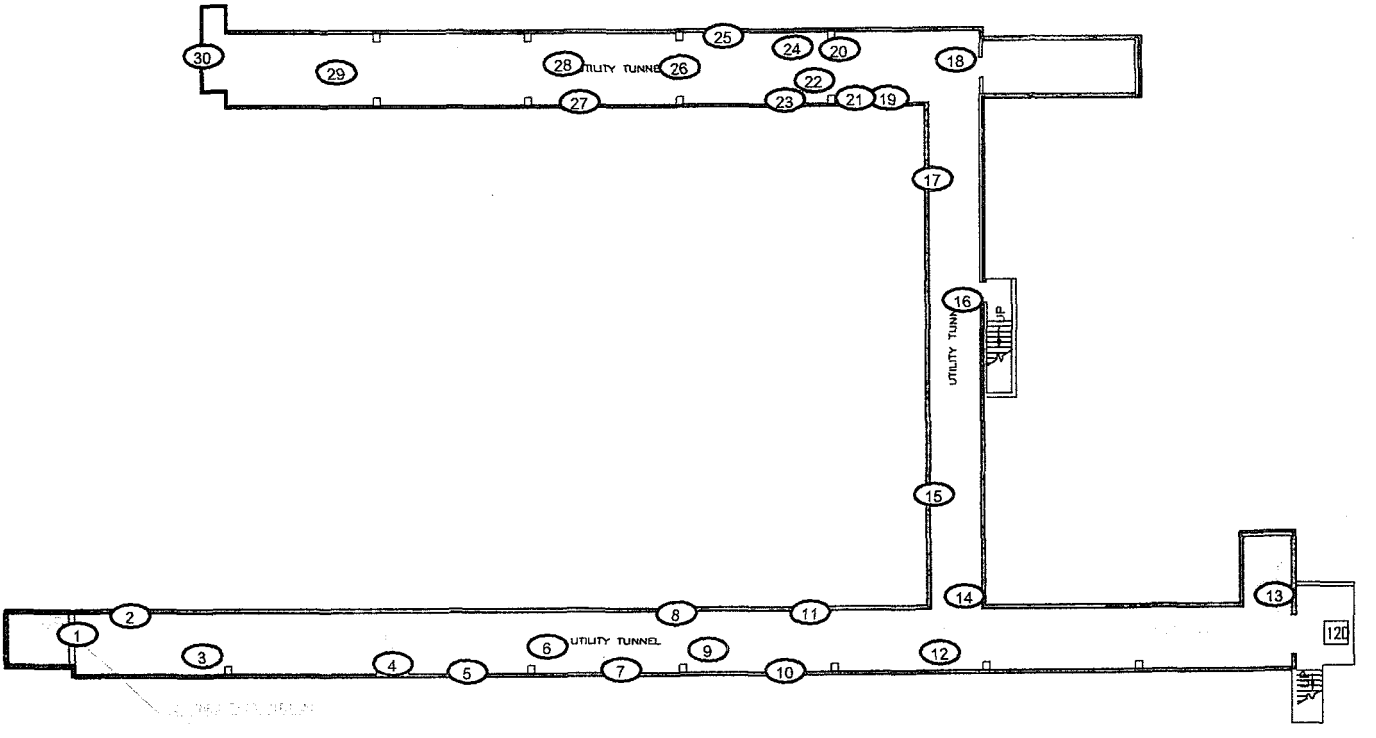
Location

	dpmα	dpmβ		dpmα	dpmβ
1	<225	<11250	26	<225	<11250
2	<225	<11250	27	<225	<11250
3	<225	<11250	28	<225	<11250
4	<225	<11250	29	<225	<11250
5	<225	<11250	30	<225	<11250
6	<225	<11250			
7	<225	<11250			
8	<225	<11250			
9	<225	<11250			
10	<225	<11250			
11	<225	<11250			
12	<225	<11250			
13	<225	<11250			
14	<225	<11250			
15	<225	<11250			
16	<225	<11250			
17	<225	<11250			
18	<225	<11250			
19	<225	<11250			
20	<225	<11250			
21	<225	<11250			
22	<225	<11250			
23	<225	<11250			
24	<225	<11250			
25	<225	<11250			

70

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: D **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: <2m Floor & Walls
Total Area: N/A sq. m. **Total Floor Area: 500 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

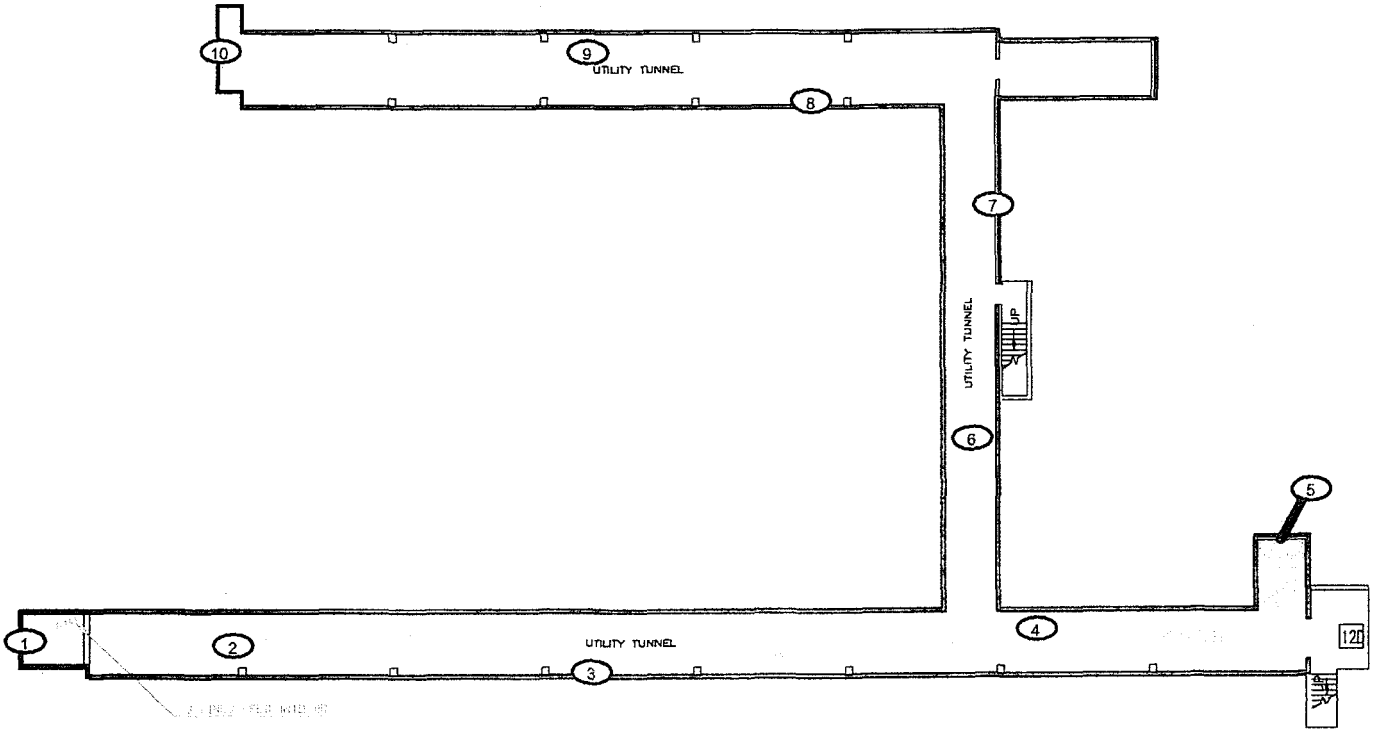
Prepared for: KAISER-HILL

MAP ID: 02-0355/991D-FW2 April 9, 2002

11

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: D **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: >2m Floor & Walls
Total Area: N/A sq. m. **Total Floor Area: 500 sq. m.**



Ceiling points
2, 4, 6, 9

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp
THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0355/991D-FW April 9, 2002

72

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1379
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	11/20/02
Bkg	0 cpmα	Bkg	0.2 cpmα	Bkg	6.7 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	17.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	85 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1379
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	11/20/02
Bkg	36 cpmβ	Bkg	33 cpmβ	Bkg	921 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	491 dpmβ

Survey Type: Contamination
Building: 991
Location: Area D WC
Purpose: Reconnaissance Level Characterization
RWP #: 02-991-0008
Date: 7/17/02 Time: 0900
RCT: A. Conley [signature] [redacted]
Print name Signature
RCT: B. Gallagher [signature] [redacted]
Print name Signature Emp. #

PRN/REN # : N/A
Comments: Survey on walls at height >2 meters and ceiling where possible.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	3	0	50	184
2	See map for location	0	12	87	672
3	See map for location	3	0	52	614
4	See map for location	0	32	104	454
5	See map for location	3	8	46	532
6	See map for location	0	0	81	290
7	See map for location	3	0	58	300
8	See map for location	0	0	110	1440
9	See map for location	6	0	127	4058
10	See map for location	0	0	75	1819

Scans were not required on these locations. All 1 minute pats were less than the investigative limits 225 dpm α and 11250 dpm β.

Date Reviewed: 7-22-02 **RS Supervision:** Teresa Johnston [signature] [redacted]
Print Name Signature

13

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1379
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	11/20/02
Bkg	0 cpmα	Bkg	0.2 cpmα	Bkg	6.7 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	17.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	85 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1379
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	11/20/02
Bkg	36 cpmβ	Bkg	33 cpmβ	Bkg	921 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	491 dpmβ

Survey Type: Contamination
Building: 991
Location: Area D Equip
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/17/02 Time: 0900

RCT: P. Vestal
Print name Signature [redacted]

RCT: A. Munoz
Print name Signature Emp. #

PRN/REN #: N/A
Comments: Survey on various pieces of equipment.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	Lightfixture	3	0	214	2000
2	Guard phone	0	0	179	5679
3	Chalkboard	0	24	191	3689
4	Cooling water supply	0	0	23	577
5	Lightfixture	0	0	104	2512
6	Roof Drain	3	24	145	2597
7	Fan	3	0	40	0
8	Emer. Light	0	40	150	68
9	Fire system pipe	0	0	35	0
10	Sanitary sewer line	0	28	168	0
11	Elect. Junction box	0	12	12	0
12	Elec. Switch	0	8	116	0
13	Fire valve	3	8	46	0
14	Emer. light	0	0	58	0
15	Fire drain line	3	4	46	0
16	Elect. Junction box	3	0	0	0
17	Sanitary sewer line	3	12	87	0
18	Fire water line	6	0	17	0
19	Firephone	6	0	75	0
20	Speaker	0	0	52	0
21	Cooling water tank	0	0	6	0
22	Cooling water supply	0	0	35	0
23	Spray water tank	6	0	17	0
24	Light strip	3	0	17	560
25	Emer. Light	12	0	75	0

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
26	Elect. Conduit box	3	52	17	0
27	Elect. Conduit box	6	0	12	0
28	Safety switch	0	0	52	0
29	Emer. Light	0	28	58	0
30	Fire suppression system	0	0	0	0

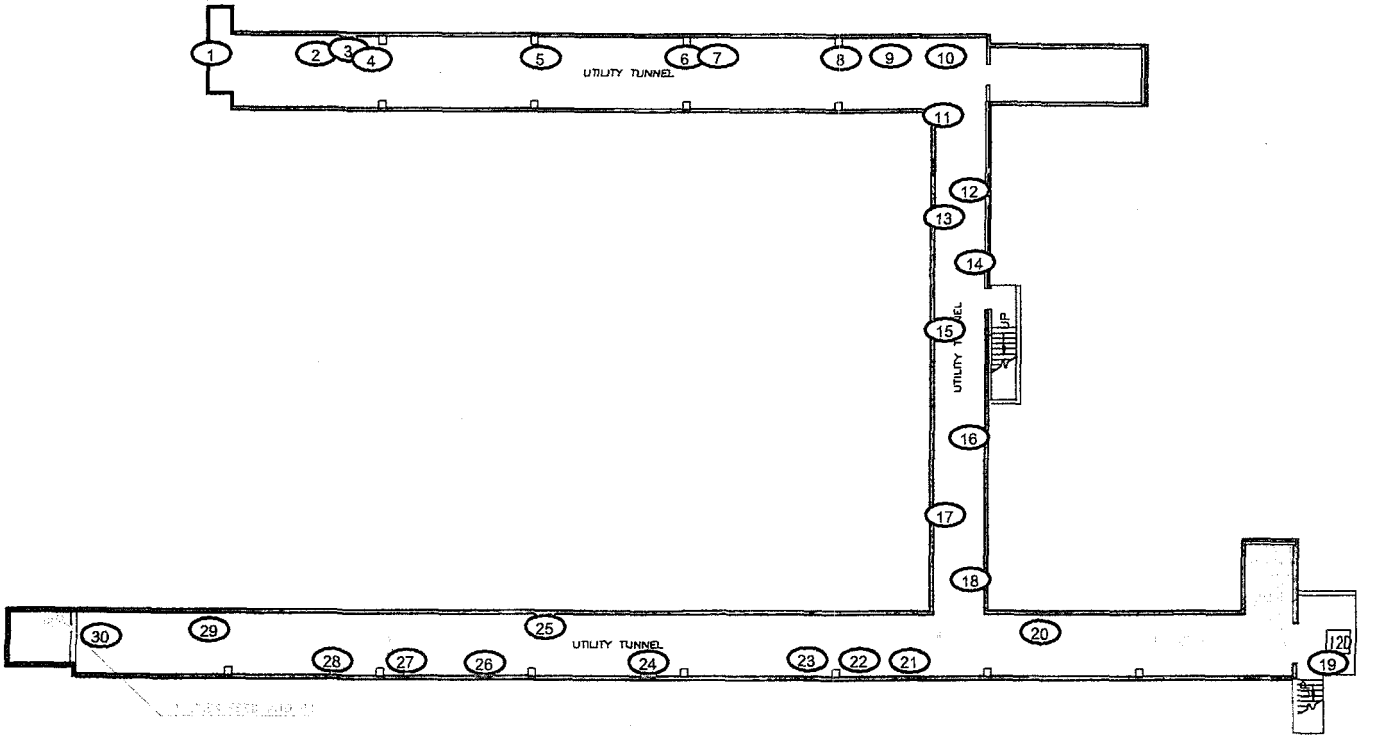
Scans were not required on this equipment. All 1 minute pats were less than the investigative limits 225 dpm α and 11250 dpm β.

Elevated Activity due to high radon levels RCW 9/16/02

Date Reviewed: 7-22-02 **RS Supervision:** Teresa Thaxton
Print Name Signature [redacted]

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: D **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: Equipment Location
Total Area: N/A sq. m. **Total Floor Area: 500 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for:
KAISER-HILL

MAP ID: 02-0355/991D-EQ April 9, 2002

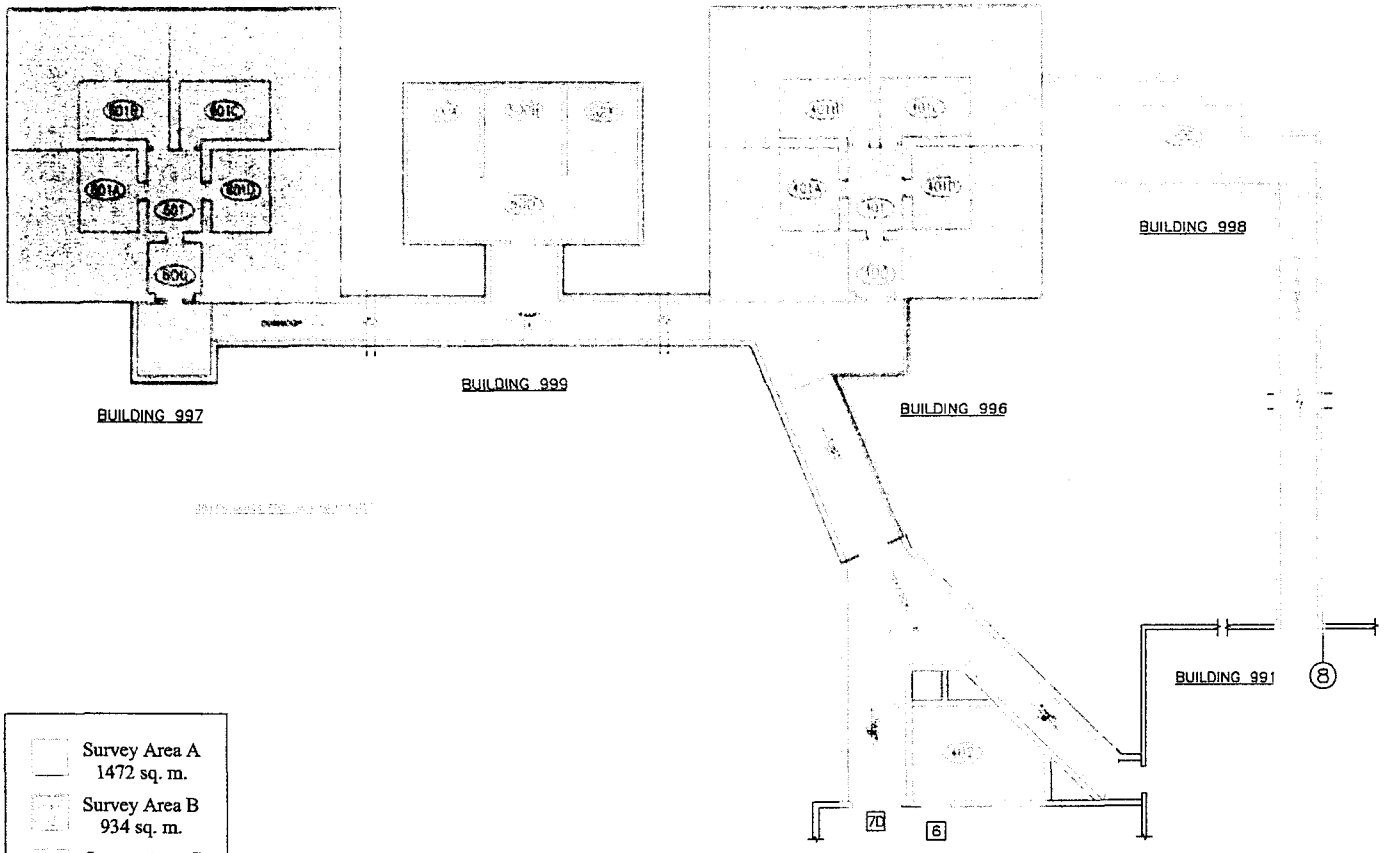
ATTACHMENT C-5

SURVEY AREA - E

Radiological Data Summary and Survey Maps

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: E **Survey Unit: N/A** **Classification: N/A**
Building: 996, 997, 998 & 999
Survey Unit Description: 997 Floor Plan
Total Area: N/A sq. m. **Total Floor Area: 1446 sq. m.**



BLDG 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0335/B997-C February 12, 2002

77

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	394
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	1/12/03
Bkg	0.1 cpmα	Bkg	0 cpmα	Bkg	0.7 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.60 %
MDA	20 dpmα	MDA	20 dpmα	MDA	29 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	394
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	1/12/03
Bkg	37 cpmβ	Bkg	33 cpmβ	Bkg	390 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	30.10 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	314 dpmβ

Survey Type: Contamination
Building: Bldgs. 996, 997, 999
Location: Area E WF 1-35
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/23/02 Time: 1000

RCT: P. Vestal [signature] [redacted]
Print name Signature

RCT: A. Munoz [signature]
Print name Signature Emp. #

PRN/REN # : N/A
Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	See map for location	0	0	-2	598
2	See map for location	0	8	-20	159
3	See map for location	0	0	-4	209
4	See map for location	0	24	-24	-236
5	See map for location	0	16	-2	385
6	See map for location	3	0	0	-947
7	See map for location	0	36	44	412
8	See map for location	0	28	39	179
9	See map for location	0	0	53	392
10	See map for location	6	0	9	615
11	See map for location	3	28	43	-93
12	See map for location	0	40	9	150
13	See map for location	3	0	55	-628
14	See map for location	3	0	42	223
15	See map for location	0	0	7	63
16	See map for location	0	28	22	40
17	See map for location	0	0	71	90
18	See map for location	6	0	27	585
19	See map for location	0	0	33	-73
20	See map for location	3	60	69	618
21	See map for location	0	0	-60	-389
22	See map for location	0	0	115	382
23	See map for location	0	28	33	339
24	See map for location	0	8	38	329
25	See map for location	0	0	11	70

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
26	See map for location	3	4	31	256
27	See map for location	6	16	14	522
28	See map for location	3	48	15	10
29	See map for location	0	16	18	854
30	See map for location	6	0	58	106
31	See map for location	0	0	75	342
32	See map for location	0	0	-21	-4173
33	See map for location	3	0	24	-635
34	See map for location	3	12	-35	-1196
35	See map for location	0	0	7	322

As directed by the Radiation Engineer, surveys in this area required extended count times and a background count at each location due to high concentrations of radon and the sources of radiation in the area (drums). Background counts were taken at each location and subtracted from the gross counts. The resulting net counts were converted to dpm (net counts/efficiency of the instrument) and record on the survey. A negative number is generated when the background count is higher than the gross count.

Date Reviewed: 7-29-02 **RS Supervision:** Teresa Johnston [signature] [redacted]
Print Name Signature

RADIOLOGICAL SAFETY

Scan Investigation Sheet

Bldgs. 996, 997, 999 | Area E WF 1-35 | Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

Location

	dpmα	dpmβ		dpmα	dpmβ
1	<225	<11250	26	<225	<11250
2	<225	<11250	27	<225	<11250
3	<225	<11250	28	<225	<11250
4	<225	<11250	29	<225	<11250
5	<225	<11250	30	<225	<11250
6	<225	<11250	31	<225	<11250
7	<225	<11250	32	<225	<11250
8	<225	<11250	33	<225	<11250
9	<225	<11250	34	<225	<11250
10	<225	<11250	35	<225	<11250
11	<225	<11250			
12	<225	<11250			
13	<225	<11250			
14	<225	<11250			
15	<225	<11250			
16	<225	<11250			
17	<225	<11250			
18	<225	<11250			
19	<225	<11250			
20	<225	<11250			
21	<225	<11250			
22	<225	<11250			
23	<225	<11250			
24	<225	<11250			
25	<225	<11250			

79

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1260
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	8/27/02
Bkg	0 cpmα	Bkg	0.1 cpmα	Bkg	3 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.50 %
MDA	20 dpmα	MDA	20 dpmα	MDA	48 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1260
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	8/27/02
Bkg	30 cpmβ	Bkg	34 cpmβ	Bkg	314 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.70 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	287 dpmβ

Survey Type: Contamination
Building: Bldgs. 996, 997, 999
Location: Area E WF 36-45
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/24/02 Time: 1300

RCT: S. Voorhies /S. Voorhies [redacted]
Print name Signature

RCT: B. Gallagher /B. Gallagher [redacted]
Print name Signature Emp. #

PRN/REN #: N/A
Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2.

SURVEY RESULTS

As directed by the Radiation Engineer, surveys in this area required extended count times and a background count at each location due to high concentrations of radon and the sources of radiation in the area (drums). Background counts were taken at each location and subtracted from the gross counts. The resulting net counts were converted to dpm (net counts/efficiency of the instrument) and record on the survey. A negative number is generated when the background count is higher than the gross count.

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
36	See map for location	3	0	42	-539
37	See map for location	0	12	-44	185
38	See map for location	0	20	60	-4040
39	See map for location	0	20	19	7744
40	See map for location	0	20	37	-9764
41	See map for location	6	0	79	3030
42	See map for location	3	0	84	-6397
43	See map for location	0	0	2	-20539
44	See map for location	0	8	60	-2357
45	See map for location	0	8	82	-9764

Date Reviewed: 7-29-02 RS Supervision: Teresa Johnston /Teresa Johnston [redacted]
Print Name Signature

RADIOLOGICAL SAFETY

Scan Investigation Sheet

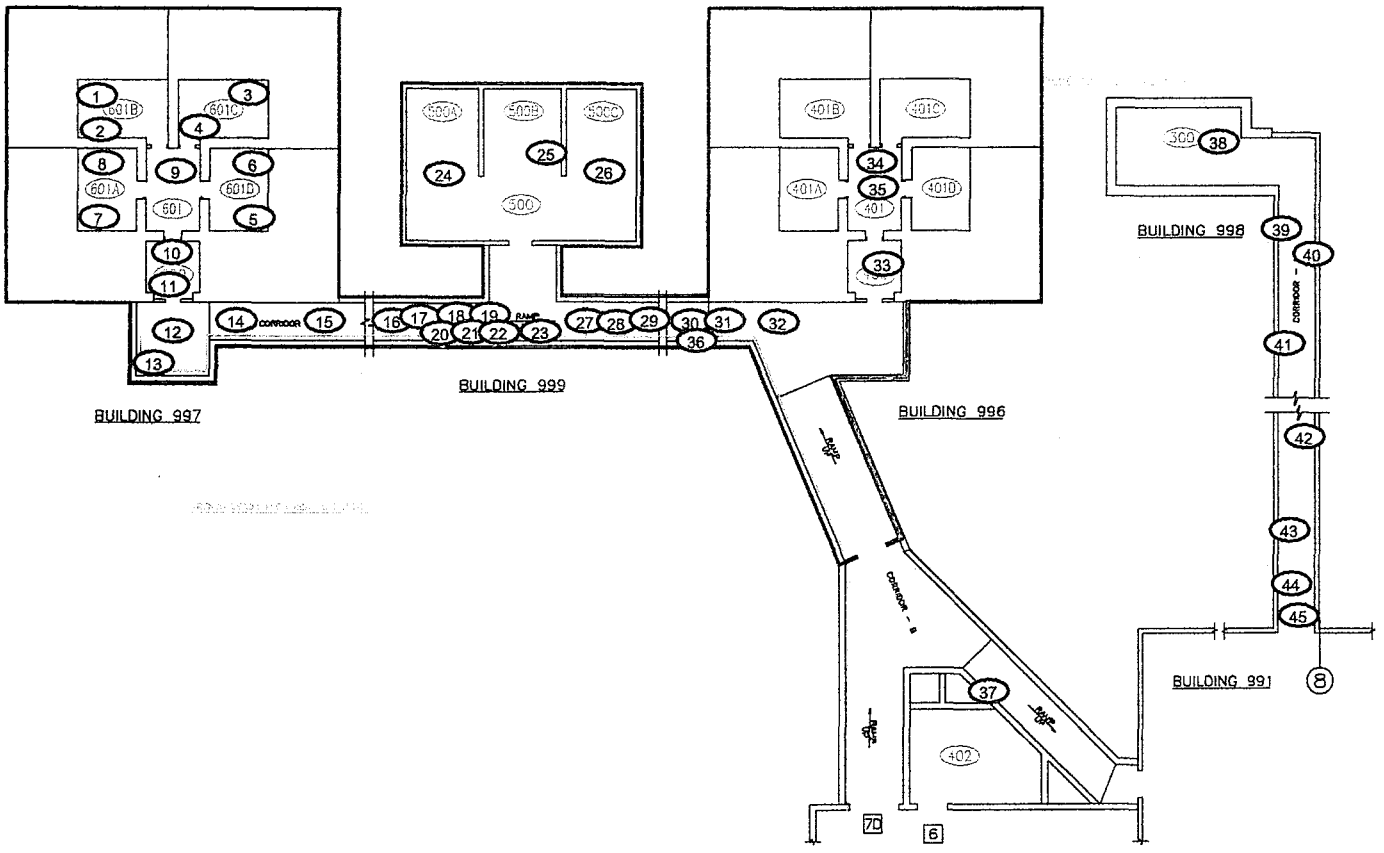
Bldgs. 996, 997, 99S | Area E WF 36-45 | Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

Location	dpmα	dpmβ
36	<225	<11250
37	<225	<11250
38	<225	<11250
39	<225	<11250
40	<225	<11250
41	<225	<11250
42	<225	<11250
43	<225	<11250
44	<225	<11250
45	<225	<11250

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: E **Survey Unit: N/A** **Classification: N/A**
Building: 996, 997, 998 & 999
Survey Unit Description: <2m Floor & Walls
Total Area: N/A sq. m. **Total Floor Area: 1446 sq. m.**



BLDG 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0335/991E-FW April 9, 2002

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1379
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	11/30/02
Bkg	0 cpmα	Bkg	0.1 cpmα	Bkg	2 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	17.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	54 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1379
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	11/30/02
Bkg	30 cpmβ	Bkg	34 cpmβ	Bkg	349 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	306 dpmβ

Survey Type: Contamination
Building: Bldgs. 996, 997, 999
Location: Area E WC
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/24/02

RCT: P. Vestal
Print name

RCT: A. Munoz
Print name Signature

PRN/REN # : N/A
Comments: Survey on walls at height >2 meters and ceiling where possible. Areas above investigation limits of 225α and 11250B were scanned.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	3	0	6	246
2	See map for location	0	0	23	229
3	See map for location	0	36	156	290
4	See map for location	0	12	14	215
5	See map for location	0	36	81	147
6	See map for location	0	0	9	-38
7	See map for location	0	40	46	529
8	See map for location	0	4	-20	399
9	See map for location	3	0	23	423
10	See map for location	0	56	-331	-19113
11	See map for location	0	52	29	-7509
12	See map for location	0	0	2	-13993
13	See map for location	0	0	-165	-23891
14	See map for location	0	8	-10	-5802
15	See map for location	0	0	-20	1024

Scans were not required on these locations. All pats were less than the investigative limits 225 dpm α and 11250 dpm β.

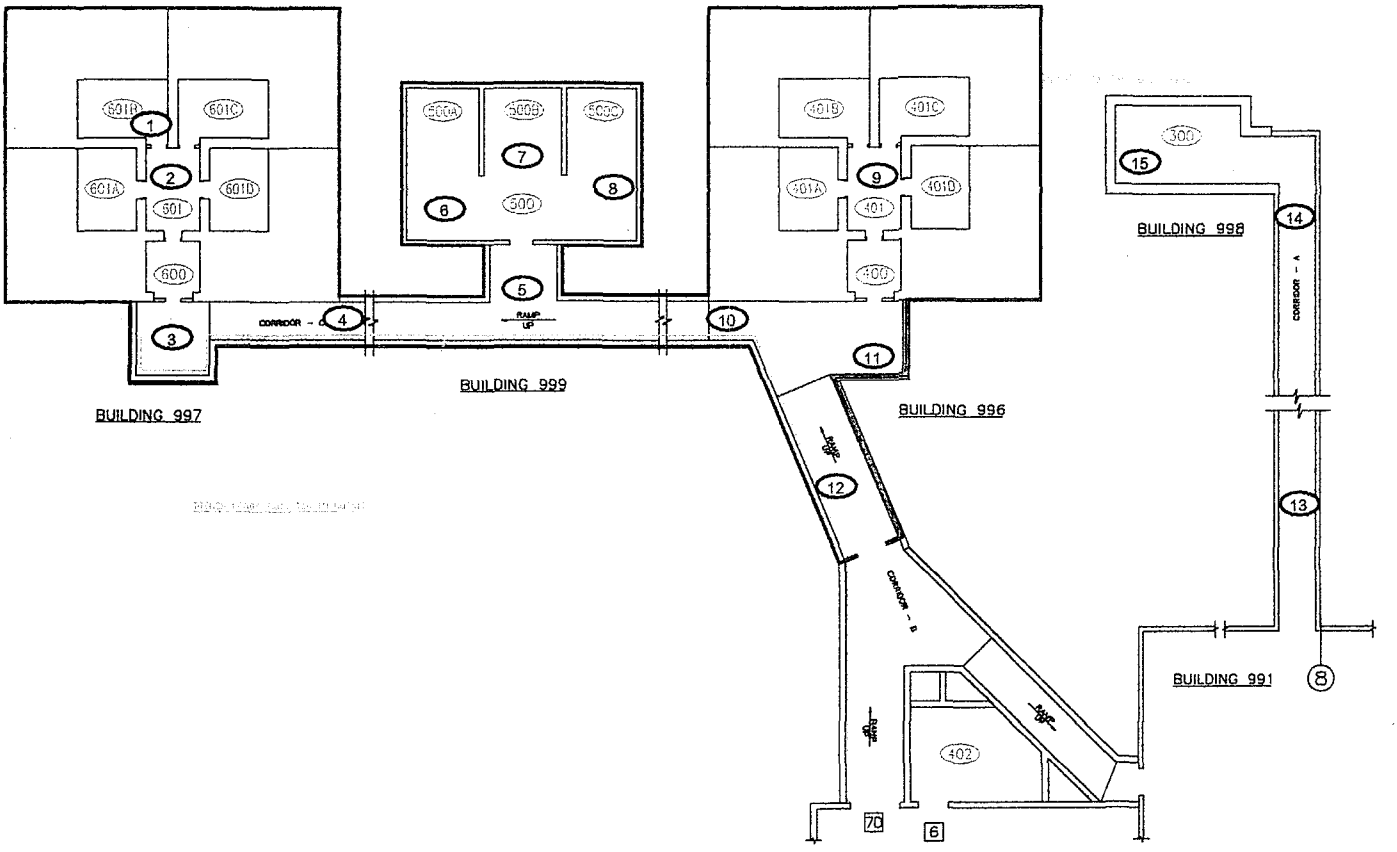
As directed by the Radiation Engineer, surveys in this area required extended count times and a background count at each location due to high concentrations of radon and the sources of radiation in the area (drums). Background counts were taken at each location and subtracted from the gross counts. The resulting net counts were converted to dpm (net counts/efficiency of the instrument) and record on the survey. A negative number is generated when the background count is higher than the gross count.

Date Reviewed: 7-29-02 **RS Supervision:** Teresa Johnston
Print Name Signature

83

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: E **Survey Unit: N/A** **Classification: N/A**
Building: 996, 997, 998 & 999
Survey Unit Description: >2m Ceiling & Walls
Total Area: N/A sq. m. **Total Floor Area: 1446 sq. m.**



BLDG 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

NO SCALE

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0335/991E-CW September 16, 2002

84

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	1241
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	8/26/02
Bkg	0 cpmα	Bkg	0.1 cpmα	Bkg	1.3 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.70 %
MDA	20 dpmα	MDA	20 dpmα	MDA	37 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1241
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	8/26/02
Bkg	30 cpmβ	Bkg	34 cpmβ	Bkg	227 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.60 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	246 dpmβ

Survey Type: Contamination
Building: Bldgs. 996, 997, 999
Location: Area E Equip.
Purpose: Reconnaissance Level Characterization

RWP #: 02-991-0008

Date: 7/24/02 Time: 1400

RCT: J. B. Abney [signature] [redacted]
Print name Signature

RCT: J. Absher [signature]
Print name Signature Emp. #

PRN/REN # : N/A

Comments: Survey on various pieces of equipment. As directed by the Radiation Engineer, surveys in this area required extended count times and a background count at each location due to high concentrations of radon and the sources of radiation in the area (drums). Background counts were taken at each location and subtracted from the gross counts. (Continued below)

SURVEY RESULTS

Swipe #	Location / Description	Removable		Total	
	Results in DPM/100sq.cm	Alpha	Beta	Alpha	Beta
1	Elect. Outlet Rm 601B	3	8	14	-595
2	NMSL Holder Rm 601	0	20	7	98
3	Emer. Light Rm 601	0	0	48	-253
4	Oxide can holder Rm 600	3	0	16	-395
5	Elect. Panel Corridor C	0	56	51	-267
6	Transformer Corridor C	0	8	85	-213
7	Ventilation Duct Corr C	3	16	23	-351
8	Ventilation Duct Corr C	0	20	46	-507
9	Wall Guard Corr C	9	0	145	-155
10	Angle Iron Corr C	0	0	53	-709
11	Elect. Outlet Corr C	0	0	141	-280
12	Cold water pipe Corr C	0	0	74	68
13	Metal shelves Rm 500B	0	0	-18	-341
14	Emer. Light Rm 500B	3	4	159	-486
15	Oxide can holder Corr B	0	40	-19	-453
16	Elect. Box Rm 400	0	0	18	-392
17	Elect. Box Corr B	0	28	7	-642
18	Cage Plate Corr B	0	0	14	-152
19	Junction Box Corr B	0	0	-14	10
20	Guard Telephone Corr B	0	0	25	-574
21	Elect. Box Corr B	0	0	-37	-595
22	Alarm pull box Corr B	3	0	-2	-473
23	Camera elect. Box Corr B	3	0	25	-145
24	Elect. Wall strip Rm 300	0	0	88	4392
25	Elect. Wall strip Rm 301	3	0	75	-4392

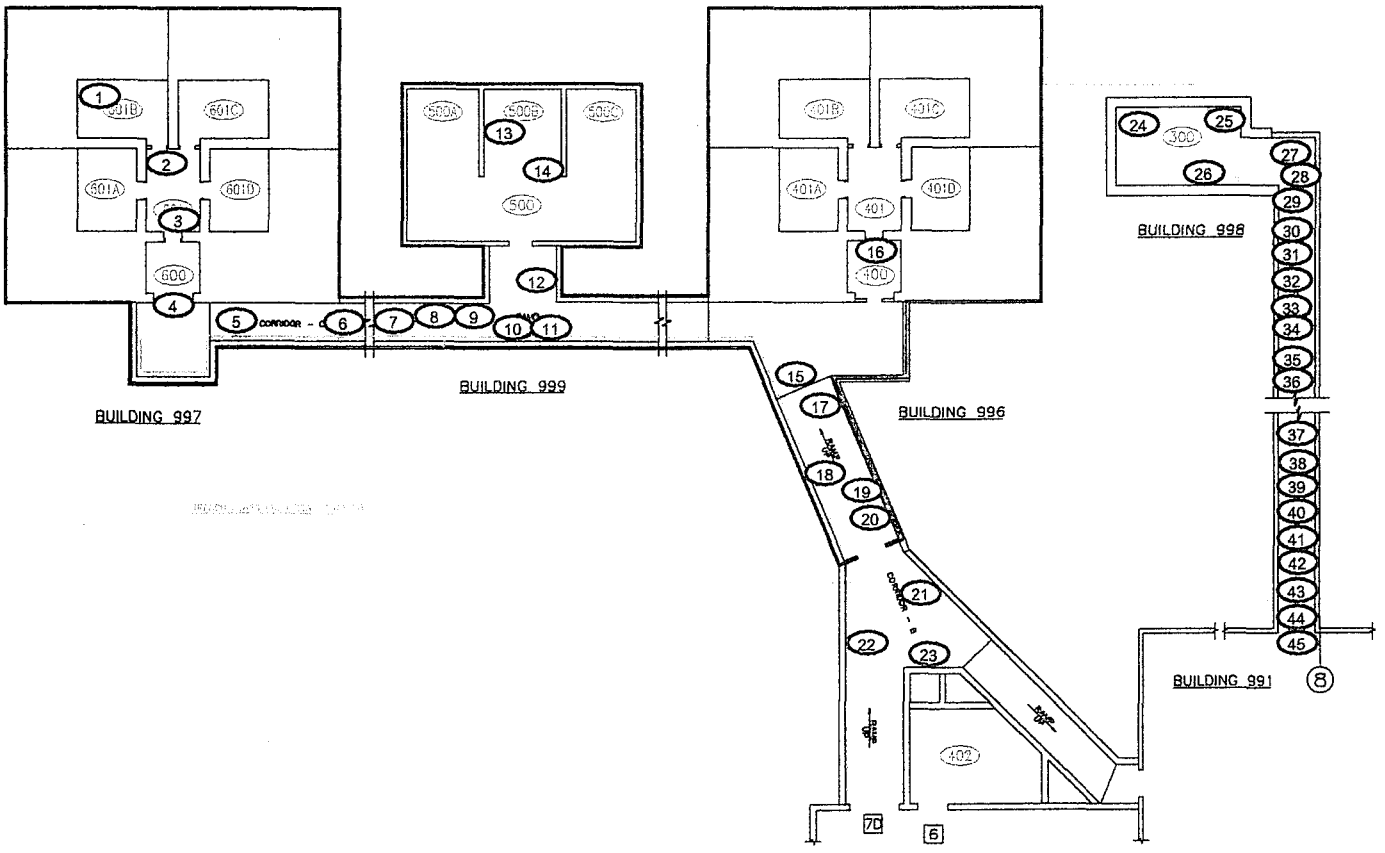
Swipe #	Location / Description	Removable		Total	
	Results in DPM/100sq.cm	Alpha	Beta	Alpha	Beta
26	Emer. Light Rm 300	0	20	111	4054
27	Ventilation Duct Corr A	0	0	41	-9797
28	Elect. Wall strip Corr A	0	0	81	5743
29	Elect. Wall strip Corr A	0	0	121	-3041
30	Breaker box Corr A	0	0	14	-11824
31	Ventilation Duct Corr A	0	36	52	-2027
32	Breaker box Corr A	0	36	-58	-12162
33	Ventilation Duct Corr A	0	12	83	-2703
34	Elect. Wall strip Corr A	0	0	34	-15203
35	Ventilation Duct Corr A	0	24	8	-2703
36	Breaker box Corr A	0	0	-28	-6419
37	Emer. Light Corr A	0	8	-1	-338
38	Sprinkler supply line	3	0	1	-18919
39	Ventilation Duct Corr A	0	12	51	-956
40	Elect. outlet Corr A	0	0	52	-3716
41	Ventilation Duct Corr A	0	0	85	-2365
42	Breaker box Corr A	0	28	63	-1689
43	Conduit Corr A	0	0	46	10811
44	Elect. Panel Corr A	0	0	2	-1030
45	Elect. Panel Corr A	0	52	28	-2703

The resulting net counts were converted to dpm (net counts/efficiency of the instrument) and recored on the survey. A negative number is generated when the background count is higher than the gross count.

Date Reviewed: 7-29-02 **RS Supervision:** Teresa Johnston [signature] [redacted]
Print Name Signature

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: E **Survey Unit: N/A** **Classification: N/A**
Building: 996, 997, 998 & 999
Survey Unit Description: Equipment Location
Total Area: N/A sq. m. **Total Floor Area: 1446 sq. m.**



BLDG 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0335/991E-EQ September 16, 2002

96

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	824	Serial #	851	Serial #	396
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	1/12/03
Bkg	0 cpmα	Bkg	0.4 cpmα	Bkg	0 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	23.40 %
MDA	20 dpmα	MDA	20 dpmα	MDA	12 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	835	Serial #	396
Cal Due	10/30/02	Cal Due	7/16/03	Cal Due	1/12/03
Bkg	29.8 cpmβ	Bkg	34 cpmβ	Bkg	379 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	33.00 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	283 dpmβ

Survey Type: Contamination
Building: 991
Location: Tunnels 996, 997, 998, & 999
Purpose: Reconnaissance Level Characterization
RWP #: 02-991-0008
Date: 8/28/02 **Time:** 0700

RCT: S. Voorhies / S. Voorhies / [redacted]
Print name Signature

RCT: B. Gallagher / B. Gallagher / [redacted]
Print name Signature

PRN/REN # : N/A
Comments: Survey of supply and return ducts in the tunnels of 991. Survey was taken over a period of a couple of days. Smears were counted on 8/23/02

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	Return Duct/Vent	0	n/a	-9	n/a
2	Supply Duct/Vent	9	n/a	49	n/a
3	Supply Duct/Vent	0	n/a	-229	n/a
4	Return Duct/Vent	9	n/a	93	n/a
5	Return Duct/Vent	0	n/a	31	n/a
6	Return Duct/Vent	3	n/a	28	n/a
7	Supply Duct/Vent	12	n/a	22	n/a
8	Supply Duct/Vent	6	n/a	33	n/a
9	Return Duct/Vent	12	n/a	62	n/a
10	Return Duct/Vent	0	n/a	353	n/a
11	Supply Duct/Vent	3	n/a	-5	n/a

The tunnels of 991 have a high concentration of radon present. There are also sources of radiation present from the storage of drums in the area. As per Rad Engineer (Roger Worrick) instructions a 4 minute backgroud and a 4 minute count were taken at each location. The resulting readings produced a negative number in some cases when the background was higher than the actual count. In addition the beta background is extremely high and not documented in this survey.

Date Reviewed: 9/16/02 **RS Supervision:** R. Worrick for / [signature] / [redacted]
Print Name Signature

T. Johnston

87

Survey Area:	E	Survey Unit:	N/A	Building:	991

Survey Unit/Area Description:
B991Tunnels Paint Sample Locations

Instrument: NE Electra SN1250	Cal. Due 10/10/02	EFF (Alpha)	0.213	EFF (Beta)	0.283			

Total Surface Activity Data Sheet

Sample Location	Material Type (If Required)	Pre Total Surface Activity Measurements (Alpha)				PreTotal Surface Activity Measurements (Beta)			
		LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2	LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2
1	Paint	16	22	6	28	829	888	59	208
2	Paint	16	22.5	6.5	31	783	855	72	254
3	Paint	20	20	0	0	766	855	89	314
4	Paint	41.5	35	-6.5	-31	922	940	18	64
5	Paint	22.5	38	15.5	73	6170	6183	13	46
6	Paint	40	87	47	221	903	989	86	304
7	Paint	28	27	-1	-5	11100	10900	-200	-707
8	Paint	34.5	54	19.5	92	923	1030	107	378
9	Paint	42	49	7	33	886	942	56	198
10	Paint	20	18	-2	-9	829	893	64	226
11	Paint	22.5	25.5	3	14	806	933	127	449
12	Paint	64.1	78.6	14.5	68	27900	26000	-1900	-6714
13	Paint	118	140	22	103	43200	37500	-5700	-20141
14	Paint	30	40	10	47	784	957	173	611
15	Paint	22.5	27	4.5	21	802	917	115	406
16	Paint	33	39	6	28	2153	2159	6	21
17	Paint	30.5	47.5	17	80	868	928	60	212
18	Paint	11.5	11	-0.5	-2	809	886	77	272
19	Paint	22.5	26	3.5	16	811	808	-3	-11
20	Paint	28	41.5	13.5	63	1330	1447	117	413
21	Paint	14.5	16	1.5	7	786	862	76	269
22	Paint	18	24	6	28	820	858	38	134
23	Paint	33	45	12	56	869	927	58	205
24	Paint	35.5	40.5	5	23	828	836	8	28
25	Paint	41.5	37	-4.5	-21	864	879	15	53
26	Paint	35.5	48	12.5	59	985	844	-141	-498
27	Paint	39	59.5	20.5	96	1380	1402	22	78
28	Paint	30	29	-1	-5	1185	1174	-11	-39
29	Paint	92.6	72.6	-20	-94	24700	25300	600	2120
30	Paint	126	138	12	56	44100	54000	9900	34982

Comments: High Radon levels and Radioactive Waste Drums in the Survey Area Are the cause of high and low (negative) measurements. RWW 9/16/02

89

Survey Area:	E	Survey Unit:	N/A	Building:	991

Survey Unit/Area Description:

B991Tunnels Paint Sample Locations

Instrument: NE Electra SN1250	Cal. Due 10/10/02	EFF (Alpha)	0.213	EFF (Beta)	0.283			

Total Surface Activity Data Sheet

Sample Location	Material Type (If Required)	Post Total Surface Activity Measurements (Alpha)				PostTotal Surface Activity Measurements (Beta)			
		LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2	LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2
1	Paint	22.5	31	8.5	40	849	939	90	318
2	Paint	26.2	24	-2.2	-10	704	780	76	269
3	Paint	16.5	22.5	6	28	862	923	61	216
4	Paint	54.5	40.5	-14	-66	1026	969	-57	-201
5	Paint	31.8	21.5	-10.3	-48	4692	4499	-193	-682
6	Paint	20	31.5	11.5	54	760	835	75	265
7	Paint	37.5	43	5.5	26	7785	7307	-478	-1689
8	Paint	55	53.5	-1.5	-7	1335	1046	-289	-1021
9	Paint	43	46	3	14	872	974	102	360
10	Paint	18.5	22.5	4	19	696	797	101	357
11	Paint	22	32.5	10.5	49	886	913	27	95
12	Paint	38.8	48.3	9.5	45	14900	15000	100	353
13	Paint	55.3	59.6	4.3	20	21800	20300	-1500	-5300
14	Paint	18	39	21	99	828	949	121	428
15	Paint	30.5	28.5	-2	-9	842	992	150	530
16	Paint	26	47	21	99	2170	2136	-34	-120
17	Paint	30.5	30	-0.5	-2	894	953	59	208
18	Paint	20	28.5	8.5	40	861	941	80	283
19	Paint	19.5	20	0.5	2	718	776	58	205
20	Paint	24	32.5	8.5	40	1401	1140	-261	-922
21	Paint	22	19.5	-2.5	-12	821	899	78	276
22	Paint	14	31.5	17.5	82	878	941	63	223
23	Paint	26.5	46	19.5	92	897	936	39	138
24	Paint	30.5	27	-3.5	-16	842	860	18	64
25	Paint	30.5	30	-0.5	-2	767	823	56	198
26	Paint	38.5	48	9.5	45	883	901	18	64
27	Paint	62.5	66	3.5	16	1267	1395	128	452
28	Paint	32	42	10	47	1278	1227	-51	-180
29	Paint	39.3	43.8	4.5	21	13500	16300	2800	9894
30	Paint	31.8	53.5	21.7	102	40800	36500	-4300	-15194

Comments: High Radiation levels and Radioactive waste Drums in the survey area are the cause of high and low (negative) measurements - Low efficiency

(PRO-475-RSP-16.01, effective 05/22/01)

90

Survey Area:	E	Survey Unit:	N/A	Building:	991

Survey Unit/Area Description:
B991 Vaults Paint Sample Locations

Instrument: NE Electra #1397	Cal. Due 3/19/03	EFF (Alpha)	0.228	EFF (Beta)	N/A

Total Surface Activity Data Sheet

Sample Location	Material Type (If Required)	Pre Total Surface Activity Measurements (Alpha)				Post Total Surface Activity Measurements (Alpha)			
		LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2	LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2
31	Paint	84.5	97.5	13	57	99.5	91	-8.5	-37
32	Paint	84	76	-8	-35	92.5	106	13.5	59
33	Paint	106	136	30	**132**	89	89	0	0
34	Paint	101	126	25	**110**	104	91	-13	-57
35	Paint	119	120	1	4	89.5	133	43.5	**191**
36	Paint	126	168	42	**184**	108	108	0	0
37	Paint	92	99.5	7.5	33	102	121	19	83
38	Paint	75.5	110	34.5	**151**	83	144	61	**268**
39	Paint	94.5	97	2.5	11	87	87.5	0.5	2
40	Paint	83	76	-7	-31	73.5	57.5	-16	-70
41	Paint	85.5	67.5	-18	-79	66.5	59	-7.5	-33
42	Paint	114	135	21	92	87	109	22	96
43	Paint	54.5	57	2.5	11	37	51.5	14.5	64
44	Paint	42.5	45	2.5	11	42	79.5	37.5	**164**
45	Paint	17.5	25.5	8	35	19	22.5	3.5	15

Comments:

41

Survey Area:	E	Survey Unit:	N/A	Building:	991

Survey Unit/Area Description:
B991Vaults Paint Sample Locations

Instrument: NE Electra #394	Cal. Due 1/12/03	EFF (Alpha)	0.228	EFF (Beta)	N/A			

Sample Location	Material Type (If Required)	Pre Total Surface Activity Measurements (Alpha)				Post Total Surface Activity Measurements (Alpha)			
		LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2	LAB (cpm)	Gross (cpm)	Net (cpm)	dpm/ 100cm^2
46	Paint	2	8	6	26.3	4	2.7	-1.3	-5.7
47	Paint	2	3	1	4.4	4	0	-4	-17.5
48	Paint	2	5	3	13.2	4	22	18	78.9
49	Paint	2	3	1	4.4	4	0	-4	-17.5
50	Paint	1.3	3.3	2	8.8	0	3.7	3.7	16.2
51	Paint	0	1	1	4.4	0	0	0	0.0
52	Paint	1	3	2	8.8	1	2	1	4.4
53	Paint	4	3	-1	-4.4	0	9	9	39.5
54	Paint	0	3	3	13.2	0	1.7	1.7	7.5
55	Paint	3.1	6	2.9	12.7	1	0	-1	-4.4
56	Paint	3	7	4	17.5	0	6	6	26.3
57	Paint	0	8	8	35.1	0	0	0	0.0
58	Paint	4	0	-4	-17.5	0	0	0	0.0
59	Paint	1	2	1	4.4	0	7	7	30.7
60	Paint	2	3	1	4.4	0	8	8	35.1

Comments:

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	Eberline	**Survey type:**	Contamination	
Model	SAC-4	Model	SAC-4	Model	SAC-4	Building:	991	
Serial #	824	Serial #	851	Serial #	963	Location:	Tunnels	
Cal Due	10/1/01	Cal Due	11/29/02	Cal Due	1/3/03	Purpose:	pre/post Paint Samples	
Bkg.	0.0 dpm α	Bkg.	0.1 dpm α	Bkg.	0.0 dpm α			
Efficiency	33.3 %	Efficiency	33.3 %	Efficiency	33.3 %	RWP #:	02-991-008	
MDA	20 dpm α	MDA	20 dpm α	MDA	20 dpm α			
						Date:	7/24/02	Time: 08:00
Mfg.	Eberline	Mfg.	Eberline	Mfg.	Eberline			
Model	BC-4	Model	BC-4	Model	BC-4	RCT:	A. Conley / [redacted]	
Serial #	704	Serial #	905	Serial #	700		Print name	Signature
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	12/13/02			
Bkg.	30.0 dpm β	Bkg.	34.0 dpm β	Bkg.	27.0 dpm β	RCT:	NA / NA / NA	
Efficiency	25 %	Efficiency	25 %	Efficiency	25 %		Print name	Signature Emp. #
MDA	200 dpm β	MDA	200 dpm β	MDA	200 dpm β			

PRN/REN # :

Comments: All LABs and TSAs Counted for 2 mins. Elevated Beta readings due to drum storage.

SURVEY RESULTS

Swipe #	LOCATION/DESCRIPTION	Pre			Post		
		Alpha Swipe dpm/100cm2	Beta Swipe dpm/100cm2	NA	Alpha Swipe dpm/100cm2	Beta Swipe dpm/100cm2	NA
1	Paint Sample Locations	0	0		0	16	
2	Paint Sample Locations	6	0		6	0	
3	Paint Sample Locations	0	0		3	28	
4	Paint Sample Locations	3	28		0	16	
5	Paint Sample Locations	0	0		0	16	
6	Paint Sample Locations	0	0		0	0	
7	Paint Sample Locations	0	0		0	32	
8	Paint Sample Locations	3	32		6	0	
9	Paint Sample Locations	3	4		0	4	
10	Paint Sample Locations	3	0		3	0	
11	Paint Sample Locations	0	28		0	0	
12	Paint Sample Locations	0	0		3	16	
13	Paint Sample Locations	0	0		0	0	
14	Paint Sample Locations	3	28		0	54	
15	Paint Sample Locations	0	40		0	0	
16	Paint Sample Locations	0	32		0	8	
17	Paint Sample Locations	3	40		3	44	
18	Paint Sample Locations	0	0		0	0	
19	Paint Sample Locations	0	36		0	0	
20	Paint Sample Locations	0	8		0	0	
21	Paint Sample Locations	3	44		3	0	
22	Paint Sample Locations	0	24		3	0	
23	Paint Sample Locations	0	0		3	60	
24	Paint Sample Locations	0	0		0	20	
25	Paint Sample Locations	0	0		0	8	
26	Paint Sample Locations	0	20		0	20	
27	Paint Sample Locations	3	4		0	28	
28	Paint Sample Locations	3	0		3	48	
29	Paint Sample Locations	0	0		0	0	
30	Paint Sample Locations	0	0	NA	0	20	NA

Date Reviewed: 9/16/02 **RS Supervision:** Roger Warnick Jr. / [redacted]

Print Name Signature

Teresa Johnston

93

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. NETech	Mfg. NETech	Mfg. Eberline
Model Electra	Model Electra	Model BC-4
Serial # 1397	Serial # 1397	Serial # 959
Cal Due 3-19-3	Cal Due 3-19-3	Cal Due 7-11-3
Bkg. 1 cpm α	Bkg. 396 cpm α	Bkg. 37.7 cpm α
Efficiency 22.8 %	Efficiency 35 %	Efficiency .33 %
MDA 32 dpm α	MDA 272 dpm α	MDA ∠200 dpm α
Mfg. Eberline	Mfg. Eberline	Mfg. Eberline
Model SAC-4	Model SAC-4	Model BC-4
Serial # 810	Serial # 11-13-025	Serial # 839
Cal Due 11-13-02	Cal Due 813	Cal Due 1-7-3
Bkg. 0.2 cpm β	Bkg. 0.3 cpm β	Bkg. 43.3 cpm β
Efficiency .33 %	Efficiency .33 %	Efficiency .25 %
MDA ∠20 dpm β	MDA ∠20 dpm β	MDA ∠200 dpm β

Survey type: Contamination
Building: 991
Location: Vaults
Purpose: pre/post Paint Samples

RWP #: 02-991-0008

Date: 10/8/02 Time: 0830

RCT: S. Voorhies / S. Voorhies
Print name Signature

RCT: J. Randall / Jay E. Randall
Print name Signature

PRN/REN #:

Comments:

SURVEY RESULTS

Swipe #	LOCATION/DESCRIPTION	Pre			Post		
		Alpha Swipe dpm/100cm2	Beta Swipe dpm/100cm2	NA	Alpha Swipe dpm/100cm2	Beta Swipe dpm/100cm2	NA
1	Paint Sample Locations	6	8		0	0	
2	Paint Sample Locations	9	0		0	0	
3	Paint Sample Locations	3	120		0	0	
4	Paint Sample Locations	0	0		0	0	
5	Paint Sample Locations	6	8		0	0	
6	Paint Sample Locations	3	20		0	4	
7	Paint Sample Locations	3	52		0	0	
8	Paint Sample Locations	0	12		0	56	
9	Paint Sample Locations	12	0		0	0	
10	Paint Sample Locations	0	0		0	0	
11	Paint Sample Locations	3	0		3	0	
12	Paint Sample Locations	0	44		3	44	
13	Paint Sample Locations	6	0		3	8	
14	Paint Sample Locations	6	0		3	8	
15	Paint Sample Locations	0	12		0	60	
16	Paint Sample Locations						
17	Paint Sample Locations						
18	Paint Sample Locations						
19	Paint Sample Locations						
20	Paint Sample Locations						
21	Paint Sample Locations						
22	Paint Sample Locations						
23	Paint Sample Locations						
24	Paint Sample Locations						
25	Paint Sample Locations						
26	Paint Sample Locations						
27	Paint Sample Locations						
28	Paint Sample Locations						
29	Paint Sample Locations						
30	Paint Sample Locations						

Locations 1-15 rcvd 1/14/03

NA SDV 10/8/02

Date Reviewed: 10-8-02 **RS Supervision:** Teresa Thaster / Teresa Thaster
Print Name Signature

[redacted]

3-PRO-164-RSP-07.01 (effective 7/12/01)

94

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	959	Serial #	833	Serial #	394
Cal Due	1/18/03	Cal Due	2/28/03	Cal Due	1/12/03
Bkg	0.2 cpmα	Bkg	0 cpmα	Bkg	22.8/30.2 cpmα+β
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	2/36 %
MDA	20 dpmα	MDA	20 dpmα	MDA	41/304 dpmα

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	702	Serial #	911	Serial #	1241
Cal Due	7/22/03	Cal Due	10/30/03	Cal Due	5/11/03
Bkg	32.9 cpmβ	Bkg	34.9 cpmβ	Bkg	1.0/357 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	21.3/22.2 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	32/300 dpmβ

Survey Type: Contamination
Building: 991
Location: Vaults
Purpose: pre/post paint samples
RWP #: 02-991-008
Date: 12/5/02 Time: 0830
RCT: Voorhies (Print name) Voorhies (Signature) [redacted]
RCT: na (Print name) / na (Signature) / na (Emp. #)

PRN/REN # : Na
Comments: Swipes counted 12/09/02

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	pre		post	
		Alpha	Beta	Alpha	Beta
46	Paint sample locations	0	0	0	4
47	Paint sample locations	0	0	3	4
48	Paint sample locations	0	0	9	12
49	Paint sample locations	0	0	0	0
50	Paint sample locations	0	0	3	0
51	Paint sample locations	0	0	0	0
52	Paint sample locations	0	0	0	0
53	Paint sample locations	3	28	0	0
54	Paint sample locations	3	0	0	0
55	Paint sample locations	0	0	0	24
56	Paint sample locations	3	24	0	0
57	Paint sample locations	0	4	0	0
58	Paint sample locations	0	0	0	4
59	Paint sample locations	0	0	0	16
60	Paint sample locations	3	0	0	0

Date Reviewed: 12-9-02 **RS Supervision:** Teresa Johnston (Print Name) Teresa Johnston (Signature) [redacted] 12-9-02

B991 Area E
Media Conversion Calculations

LOCATION DESCRIPTION	MEDIA SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in^2)	INDIVIDUAL NUCLIDE ($dpm/100cm^2$) (3)	ESTIMATED MDA ($dpm/100cm^2$) (4)	URANIUM TOTAL ($dpm/100cm^2$)	TRANSURANIC TOTAL ($dpm/100cm^2$)
B991 RLC Area E Tunnels	1,7,9,14	03S0031-016.001	U-234	3.050	0.483	24.3	24.5	104.1	16.5		
			U-235	1.040	0.115			35.5	3.9		
			U-238	3.050	0.483			104.1	16.5	243.7	
			Pu-239 Pu-240	1.267	0.449			43.2	15.3		
			Am-241	0.176	0.062			6.0	2.1		49.3
B991 RLC Area E Tunnels	8,10,11 12,13,15	03S0031-018.001	U-234	23.700	15.600	35.5	24.5	1,181.7	777.8		
			U-235	0.483	0.089			24.1	4.5		
			U-238	2.460	0.357			122.7	17.8	1,328.4	
			Pu-239 Pu-240	1.534	0.438			76.5	21.8		
			Am-241	0.213	0.061			10.6	3.0		87.1
B991 RLC Area E Tunnels	4,6	03S0031-020.001	U-234	36.100	15.000	15.8	24.5	801.1	332.9		
			U-235	0.789	0.069			17.5	1.5		
			U-238	2.070	0.361			45.9	8.0	864.5	
			Pu-239 Pu-240	1.764	0.394			39.1	8.7		
			Am-241	0.245	0.055			5.4	1.2		44.6
B991 RLC Area E Tunnels	2,3	03S0031-021.001	U-234	26.600	21.100	18.9	24.5	706.1	560.1		
			U-235	0.170	0.074			4.5	2.0		
			U-238	0.754	0.388			20.0	10.3	730.6	
			Pu-239 Pu-240	2.520	0.352			66.9	9.3		
			Am-241	0.350	0.049			9.3	1.3		76.2
B991 RLC Area E Tunnels	5	03S0031-022.001	U-234	35.000	37.700	6.3	24.5	309.7	333.6		
			U-235	0.199	0.140			1.8	1.2		
			U-238	0.692	0.780			6.1	6.9	317.6	
			Pu-239 Pu-240	5.897	0.697			52.2	6.2		
			Am-241	0.819	0.097			7.2	0.9		59.4
B991 RLC Area E Tunnels	16,17,18 19,20,21 22,23,24 25	O2D1386.032.001	U-234	27.300	19.300	88.3	24.5	3,385.6	2,393.5		
			U-235	0.409	0.057			50.7	7.1		
			U-238	2.230	0.263			276.6	32.6	3,712.9	
			Pu-239 Pu-240	0.588	0.251			72.9	31.2		
			Am-241	0.082	0.035			10.1	4.3		83.0

B991 Area E
Media Conversion Calculations

LOCATION DESCRIPTION	MEDIA SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in^2)	INDIVIDUAL NUCLIDE ($dpm/100cm^2$) (3)	ESTIMATED MDA ($dpm/100cm^2$) (4)	URANIUM TOTAL ($dpm/100cm^2$)	TRANSURANIC TOTAL ($dpm/100cm^2$)
B991 RLC Area E Tunnels	26,27,28 29,30	O2D1386.033.001	U-234	12.100	14.100	54.6	24.5	927.9	1,081.3		
			U-235	0.203	0.036			15.6	2.7		
			U-238	1.210	0.229			92.8	17.6	1,036.2	
			Pu-240	0.000	0.294			0	22.6		
			Am-241	0.000	0.041			0	3.1		0
B991 RLC Area E Tunnels	31, 33, 34	03S0007-016.001	U-234	3.970	0.180	127.2	24.5	709.2	32.2		
			U-235	0.337	0.031			60.2	5.6		
			U-238	3.970	0.180			709.2	32.2	1,478.7	
			Pu-239 Pu-240	0.273	0.222			48.8	39.7		
			Am-241	0.038	0.031			6.8	5.5		55.5
B991 RLC Area E Tunnels	32,37,38	03S0007-017.001	U-234	3.360	0.226	101.0	24.5	476.6	32.1		
			U-235	0.406	0.053			57.6	7.5		
			U-238	3.360	0.226			476.6	32.1	1,010.8	
			Pu-239 Pu-240	0.151	0.279			21.4	39.5		
			Am-241	0.021	0.039			3.0	5.5		24.4
B991 RLC Area E Tunnels Rm. 150	36,39	03S0007-021.001	U-234	49.400	41.600	17.7	24.5	1,228.1	1,034.2		
			U-235	0.452	0.218			11.2	5.4		
			U-238	14.000	1.180			348.0	29.3	1,587.3	
			Pu-239 Pu-240	0.000	1.116			0	27.7		
			Am-241	0.000	0.155			0	3.9		0
B991 RLC Area E Tunnels Rm. 150	35,40,41 42,43,45	03S0007-020.001	U-234	18.200	11.400	137.0	24.5	3,501.9	2,193.5		
			U-235	0.580	0.050			111.6	9.6		
			U-238	5.490	0.216			1,056.4	41.6	4,669.9	
			Pu-239 Pu-240	0.221	0.247			42.5	47.5		
			Am-241	0.031	0.034			5.9	6.6		48.4
B991 RLC Area E Tunnels Rm. 150	44	03S0007-022.001	U-234	476.000	5.120	22.0	24.5	14,707.8	158.2		
			U-235	15.700	0.161			485.1	5.0		
			U-238	11.900	1.120			367.7	34.6	**15,560.6**	
			Pu-239 Pu-240	5.098	1.210			157.5	37.4		
			Am-241	0.708	0.168			21.9	5.2		**179.4**

B991 Area E
Media Conversion Calculations

LOCATION DESCRIPTION	MEDIA SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in^2)	INDIVIDUAL NUCLIDE ($dpm/100cm^2$) (3)	ESTIMATED MDA ($dpm/100cm^2$) (4)	URANIUM TOTAL ($dpm/100cm^2$)	TRANSURANIC TOTAL ($dpm/100cm^2$)
B991 Area E Access area	57-60	03S0061-021.001	U-234	22.200	12.000	46.3	24.5	1,443.6	780.3		
			U-235	0.310	0.099			20.2	6.4		
			U-238	1.670	0.312			108.6	20.3	1,572.4	
			Pu-239 Pu-240	0.490	0.287			31.9	18.7		
			Am-241	0.068	0.040			4.4	2.6		36.3
B991 Area E Access area	47	03S0061-024.001	U-234	0.000	48.800	15.7	24.5	-	1,076.1		
			U-235	0.421	0.174			9.3	3.8		
			U-238	2.630	1.150			58.0	25.4	67.3	
			Pu-239 Pu-240	3.283	1.145			72.4	25.2		
			Am-241	0.456	0.159			10.1	3.5		82.5
B991 Area E Access area	49	03S0061-025.001	U-234	88.500	93.000	6.6	24.5	820.4	862.1		
			U-235	2.120	0.500			19.7	4.6		
			U-238	8.090	2.320			75.0	21.5	915.0	
			Pu-239 Pu-240	3.110	2.268			28.8	21.0		
			Am-241	0.432	0.315			4.0	2.9		32.8
B991 Area E Access area	48	03S0061-026.001	U-234	130.000	44.400	13.4	24.5	2,446.6	835.6		
			U-235	4.420	0.182			83.2	3.4		
			U-238	5.320	1.520			100.1	28.6	2,629.9	
			Pu-239 Pu-240	2.498	1.332			47.0	25.1		
			Am-241	0.347	0.185			6.5	3.5		53.6
B991 Area E Access area	46	03S0061-027.001	U-234	301.000	67.500	10.9	24.5	4,608.0	1,033.4		
			U-235	12.300	0.249			188.3	3.8		
			U-238	9.890	2.150			151.4	32.9	4,947.7	
			Pu-239 Pu-240	5.335	1.505			81.7	23.0		
			Am-241	0.741	0.209			11.3	3.2		93.0
B991 Area E Access area	53	03S0061-030.001	U-234	73.600	51.300	14.6	24.5	1,509.2	1,051.9		
			U-235	3.010	0.330			61.7	6.8		
			U-238	6.030	1.100			123.6	22.6	1,694.6	
			Pu-239 Pu-240	3.377	1.346			69.2	27.6		
			Am-241	0.469	0.187			9.6	3.8		78.9

B991 Area E
Media Conversion Calculations

LOCATION DESCRIPTION	MEDIA SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in^2)	INDIVIDUAL NUCLIDE ($dpm/100cm^2$) (3)	ESTIMATED MDA ($dpm/100cm^2$) (4)	URANIUM TOTAL ($dpm/100cm^2$)	TRANSURANIC TOTAL ($dpm/100cm^2$)
B991 Area E Access area	54	03S0061-031.001	U-234	0.000	53.700	13.5	24.5	0	1,018.2		
			U-235	1.470	0.197			27.9	3.7		
			U-238	5.290	1.120			100.3	21.2	128.2	
			Pu-239 Pu-240	2.606	1.310			49.4	24.8		
			Am-241	0.362	0.182			6.9	3.5		56.3
B991 Area E Access area	55	03S0061-032.001	U-234	9.100	2.070	8.7	24.5	111.2	25.3		
			U-235	2.870	0.389			35.1	4.8		
			U-238	9.100	2.070			111.2	25.3	257.5	
			Pu-239 Pu-240	6.718	1.994			82.1	24.4		
			Am-241	0.933	0.277			11.4	3.4		93.5
B991 Area E Access area	56	03S0061-033.001	U-234	33.800	64.300	10.8	24.5	512.7	975.3		
			U-235	1.870	0.322			28.4	4.9		
			U-238	5.690	1.460			86.3	22.1	627.4	
			Pu-239 Pu-240	0.000	1.598			0	24.2		
			Am-241	0.000	0.222			0	3.4		0
B991 Area E Access area	50	03S0061-034.001	U-234	376.000	61.700	12.4	24.5	6,548.3	1,074.5		
			U-235	15.800	0.228			275.2	4.0		
			U-238	11.900	1.490			207.2	25.9	**7,030.7**	
			Pu-239 Pu-240	4.738	1.512			82.5	26.3		
			Am-241	0.658	0.210			11.5	3.7		94.0
B991 Area E Access area	51	03S0061-035.001	U-234	0.000	48.500	10.5	24.5	-	715.2		
			U-235	2.030	0.156			29.9	2.3		
			U-238	2.780	1.240			41.0	18.3	70.9	
			Pu-239 Pu-240	5.148	0.943			75.9	13.9		
			Am-241	0.715	0.131			10.5	1.9		86.5
B991 Area E Access area	52	03S0061-036.001	U-234	0.000	50.300	9.3	24.5	-	657.0		
			U-235	0.594	0.137			7.8	1.8		
			U-238	2.790	1.000			36.4	13.1	44.2	
			Pu-239 Pu-240	3.830	0.972			50.0	12.7		
			Am-241	0.532	0.135			6.9	1.8		57.0

B991 Area E
Media Conversion Calculations

LOCATION DESCRIPTION	MEDIA SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g (2)	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in^2)	INDIVIDUAL NUCLIDE ($dpm/100cm^2$) (3)	ESTIMATED MDA ($dpm/100cm^2$) (4)	URANIUM TOTAL ($dpm/100cm^2$)	TRANSURANIC TOTAL ($dpm/100cm^2$)
									MIN	44.2	-
									MAX	**15,560.6**	**179.4**
									MEAN	2,188.6	61.3
									DCGLW =	**5,000.0**	**100.0**

(1) Paint samples collected from B991, RLC Area E, were analyzed as grouped composites using the Canberra ISOCS Gamma Spectroscopy system.

(2) Critical Level test criterion were utilized in this analysis. If the net peak area was less than the L_c (critcal level), then a "not detected" or "zero" decision was made. The LC value is always less than the applicable MDA, but greater than zero.

(3) Individual nuclide dpm/100 cm^2 conversion is conservatively based on the composite sample weight. This assumption presumes that the total sample activity from composited samples is located at one, single sample location. This methodology ensures that no single sample location exceeds the applicable DCGLW.

(4) Estimated MDA dpm/100 cm^2 conversion is conservatively based on the composite sample weight.

CANBERRA

Analysis Results Header 8/05/2002 8:44:26 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 8/05/2002 8:44:26 AM

RIN Number : 02D1386
Analytical Batch ID : 0207304732
~~Line Item Code~~ : RC10B019

B991
ACC Area E
Paint Media Samples
1 - 15

Filename: A:\G1900048.CNF

Sample Number : 02D1386-031.001
Lab Sample Number : CMLS-1534
Sample Receipt Date : 7/30/2002
Sample Volume Received : 9.85E+001 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 9.850E+001 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 7/24/2002 2:30:00 PM
Acquisition Started : 7/31/2002 3:58:19 PM

Count Time : 57600.0 seconds
Real Time : 57645.1 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/01/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 3/18/02
Efficiency Geometry ID : ISOCS Default

Analyzed By: Marilyn Umbaugh Date: 8/5/02

Reviewed By: Daniel Remington Date: 8/5/02

101

CANBERRA

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02D1386-031.001

Analytical Batch ID : 0207304732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1534

Geometry ID : ISOCS Default

Filename: A:\G1900048.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40	1.20E+001	1.06E+000	1.20E+000
CS-137	6.42E-002	1.87E-002	3.90E-002
TL-208	1.26E-001	2.77E-002	4.45E-002
PO-210	5.35E+003	2.26E+003	3.59E+003
BI-212	3.44E-001	3.19E-001	5.29E-001
PB-212	3.17E-001	2.64E-002	3.27E-002
BI-214	3.75E-001	6.71E-002	1.21E-001
PB-214	3.27E-001	4.07E-002	6.77E-002
RA-226	1.10E+000	7.59E-001	4.62E-001
AC-228	4.20E-001	6.68E-002	1.29E-001
TH-230	0.00E+000	0.00E+000	2.49E+000
Th-231	3.35E-001	8.16E-002	1.14E-001
PA-234	0.00E+000	0.00E+000	4.05E-002
PA-234M	3.45E+000	2.73E+000	3.97E+000
U-235	3.52E-001	4.63E-002	2.86E-002
U238/234	8.85E-001	1.45E-001	1.29E-001
AM-241	1.42E-001	2.64E-002	3.60E-002

102

CANBERRA

Analysis Results Header 8/06/2002 9:42:36 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 8/06/2002 9:42:36 AM

RIN Number : 02D1386
Analytical Batch ID : 0207304732
~~Line Item Code : RC10B019~~ B991

Filename: A:\G1900050.CNF

RLC Area E
Paint Media Samples
16-25

Sample Number : 02D1386-032.001
Lab Sample Number : CMLS-1535
Sample Receipt Date : 7/30/2002
Sample Volume Received : 8.83E+001 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 160 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 8.830E+001 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 7/24/2002 1:50:00 PM
Acquisition Started : 8/05/2002 7:40:02 AM

Count Time : 57600.0 seconds
Real Time : 57646.2 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/01/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 3/18/02
Efficiency Geometry ID : ISOCS Default

Analyzed By: Sheri Chambers Date: 8/6/02

Reviewed By: Daniel Remington Date: 8/6/02

103

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02D1386-032.001

Analytical Batch ID : 0207304732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1535

Geometry ID : ISOCS Default

Filename: A:\G1900050.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	1.56E+001	1.11E+000	8.34E-001
CS-137	2.57E-002	2.47E-002	4.12E-002
TL-208	2.25E-001	4.37E-002	6.86E-002
PO-210	3.75E+003	1.49E+003	3.09E+003
BI-212	5.68E-001	4.98E-001	8.29E-001
PB-212	4.88E-001	3.69E-002	3.65E-002
BI-214	7.35E-001	1.11E-001	1.83E-001
PB-214	5.53E-001	5.21E-002	7.41E-002
RA-226	2.06E+000	7.20E-001	6.51E-001
AC-228	3.91E-001	9.52E-002	1.54E-001
TH-230	0.00E+000	0.00E+000	2.99E+000
Th-231	3.56E-001	6.30E-002	1.25E-001
PA-234	0.00E+000	0.00E+000	4.75E-002
PA-234M	0.00E+000	0.00E+000	6.32E+000
U-235	2.79E-001	3.96E-002	4.03E-002
U238/234	1.32E+000	1.74E-001	1.68E-001
AM-241	4.81E-002	9.94E-003	2.06E-002

104

CANBERRA

Analysis Results Header 8/05/2002 12:11:44 PM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 8/05/2002 12:11:44 PM

RIN Number : 02D1386
Analytical Batch ID : 0207304732
Line Item Code : RC10B019

B991
RLC Area E
Paint Media Samples
26-30

Filename: A:\G1900049.CNF

Sample Number : 02D1386-033.001
Lab Sample Number : CMLS-1536
Sample Receipt Date : 7/30/2002
Sample Volume Received : 5.46E+001 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 160 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 5.460E+001 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 7/24/2002 2:28:00 PM
Acquisition Started : 8/01/2002 3:17:43 PM

Count Time : 86400.0 seconds
Real Time : 86465.4 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 7/01/02
Energy = -0.102 + 0.250*ch + -3.87E-008*ch^2 + 2.95E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/05/02
Efficiency Geometry ID : 02D1386-033.001

Analyzed By: Marilyn Umbaugh Date: 8/5/02

Reviewed By: Daniel Remington Date: 8/5/02

105

CANBERRA

Sample and QC Sample Results Summary 8/05/02 12:11:47 PM Page 2

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02D1386-033.001

Analytical Batch ID : 0207304732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1536

Geometry ID : 02D1386-033.001

Filename: A:\G1900049.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	1.50E+001	8.20E-001	9.45E-001
TL-208	1.87E-001	2.15E-002	4.32E-002
PO-210	4.52E+003	2.78E+003	4.56E+003
BI-212	5.47E-001	2.55E-001	6.14E-001
PB-212	3.54E-001	2.43E-002	4.90E-002
BI-214	5.05E-001	4.57E-002	8.90E-002
PB-214	4.42E-001	4.82E-002	9.98E-002
RA-226	2.03E+000	9.09E-001	5.74E-001
AC-228	5.47E-001	8.11E-002	1.80E-001
TH-230	0.00E+000	0.00E+000	4.00E+000
Th-231	2.79E-001	1.58E-001	1.86E-001
PA-234	0.00E+000	0.00E+000	6.02E-002
PA-234M	0.00E+000	0.00E+000	8.01E+000
U-235	2.03E-001	5.28E-002	3.55E-002
U238/234	1.21E+000	3.04E-001	2.29E-001
AM-241	0.00E+000	0.00E+000	4.09E-002

106

CANBERRA

Analysis Results Header 10/16/2002 8:20:51 AM Page 1

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**************************************************************************
*****       G A M M A   S P E C T R U M   A N A L Y S I S        *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**************************************************************************
```

Report Generated On : 10/16/2002 8:20:51 AM

RIN Number : 03S0007
Analytical Batch ID : 0210104732
Line Item Code : RC10B019

Filename: A:\G1900072.CNF

B991
RLC Survey Area E
Media Locations
31, 33, 34

Sample Number : 03S0007-016.001
Lab Sample Number : CMLS1785
Sample Receipt Date : 10/10/2002
Sample Volume Received : 1.27E+002 GRAM

Result Identifier : NA

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.272E+002 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 10/08/2002 9:50:00 AM
Acquisition Started : 10/15/2002 9:20:39 AM

Count Time : 57600.0 seconds
Real Time : 57648.4 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 10/01/02
Energy = -0.204 + 0.250*ch + -5.33E-008*ch^2 + 5.11E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/14/02
Efficiency Geometry ID : 03S0007-016.001

Analyzed By: Marilyn Umbaugh Date: 10/16/02

Reviewed By: Sean Stanfield Date: 10/16/02

107

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0007-016.001

Analytical Batch ID : 0210104732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS1785

Geometry ID : 03S0007-016.001

Filename: A:\G1900072.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40	1.65E+001	7.20E-001	7.51E-001
CS-137	0.00E+000	0.00E+000	5.38E-002
TL-208	1.95E-001	3.14E-002	4.89E-002
PO-210	0.00E+000	0.00E+000	4.86E+003
BI-212	7.01E-001	3.53E-001	5.75E-001
PB-212	5.31E-001	2.76E-002	3.70E-002
BI-214	6.27E-001	6.92E-002	1.18E-001
PB-214	5.61E-001	3.52E-002	6.57E-002
RA-226	2.13E+000	6.74E-001	5.06E-001
AC-228	4.57E-001	9.07E-002	1.74E-001
TH-230	0.00E+000	0.00E+000	3.40E+000
Th-231	4.11E-001	6.83E-002	1.43E-001
PA-234	0.00E+000	0.00E+000	4.97E-002
PA-234M	4.55E+000	1.70E+000	4.62E+000
U-235	3.37E-001	3.71E-002	3.13E-002
U238/234	3.97E+000	2.04E-001	1.80E-001
AM-241	3.79E-002	1.89E-002	3.09E-002

103

CANBERRA

Analysis Results Header 10/17/2002 8:52:20 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 10/17/2002 8:52:20 AM

RIN Number : 03S0007
Analytical Batch ID : 0210104732
Line Item Code : RC10B019

Filename: A:\G1900074.CNF

Sample Number : 03S0007-017.001
Lab Sample Number : CMLS-1786
Sample Receipt Date : 10/10/2002
Sample Volume Received : 1.01E+002 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.010E+002 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 10/08/2002 9:54:00 AM
Acquisition Started : 10/16/2002 3:34:05 PM

Count Time : 57600.0 seconds
Real Time : 57649.4 seconds
Dead Time : 0.09 %

B991
RLC Survey Area E
Media Locations
32, 37, 38

Energy Calibration Used Done On : 10/01/02
Energy = -0.204 + 0.250*ch + -5.33E-008*ch^2 + 5.11E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/14/02
Efficiency Geometry ID : 03S0007-017.001

Analyzed By: Marilyn Umbaugh Date: 10/17/02

Reviewed By: Phil Sanderson Date: 10/17/02

107

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0007-017.001

Analytical Batch ID : 0210104732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1786

Geometry ID : 03S0007-017.001

Filename: A:\G1900074.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	1.76E+001	8.16E-001	8.54E-001
CS-137	3.55E-002	1.72E-002	4.31E-002
TL-208	3.12E-001	4.22E-002	6.47E-002
PO-210	5.54E+003	1.55E+003	3.57E+003
BI-212	6.87E-001	5.45E-001	9.04E-001
PB-212	8.53E-001	3.86E-002	4.51E-002
BI-214	1.08E+000	7.41E-002	1.18E-001
PB-214	1.06E+000	5.25E-002	9.47E-002
RA-226	1.82E+000	1.18E+000	8.57E-001
AC-228	8.36E-001	1.24E-001	2.14E-001
TH-230	0.00E+000	0.00E+000	4.28E+000
Th-231	4.52E-001	8.89E-002	1.77E-001
PA-234	0.00E+000	0.00E+000	6.12E-002
PA-234M	6.50E+000	4.91E+000	7.78E+000
U-235	4.06E-001	6.37E-002	5.30E-002
U238/234	3.36E+000	2.05E-001	2.26E-001
AM-241	2.10E-002	2.32E-002	3.87E-002

110

CANBERRA

Analysis Results Header 11/4/2002 9:14:42 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 11/4/2002 9:14:42 AM

RIN Number : 03S0007
Analytical Batch ID : 0210224732
Line Item Code : RC10B019

Filename: A:\G1900080.CNF

B991

Sample Number : 03S0007-021.001
Lab Sample Number : CMLS-1851
Sample Receipt Date : 10/23/2002
Sample Volume Received : 1.77E+001 Grams

RLC Survey Area E

Result Identifier : N/A

Media Locations

36, 39

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.770E+001 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 10/8/2002 10:15:00 AM
Acquisition Started : 10/28/2002 12:47:18 PM

Count Time : 57600.0 seconds
Real Time : 57646.2 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 10/1/02
Energy = -0.204 + 0.250*ch + -5.33E-008*ch^2 + 5.11E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/23/02
Efficiency Geometry ID : 03S0007-021.001

Analyzed By: Sheri Chambers Date: 11/04/02

Reviewed By: Sean Stanfield Date: 11/05/02

111

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0007-021.001

Analytical Batch ID : 0210224732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1851

Geometry ID : 03S0007-021.001

Filename: A:\G1900080.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	4.84E+001	3.81E+000	4.80E+000
CS-137	0.00E+000	0.00E+000	3.62E-001
TL-208	4.84E-001	1.59E-001	2.54E-001
PO-210	2.25E+004	1.26E+004	2.04E+004
BI-212	0.00E+000	0.00E+000	5.09E+000
PB-212	7.15E-001	3.36E-001	5.09E-001
BI-214	1.24E+000	3.25E-001	5.76E-001
PB-214	6.50E-001	2.06E-001	3.97E-001
RA-226	1.60E+001	7.55E+000	3.52E+000
AC-228	1.43E+000	6.00E-001	1.14E+000
TH-230	0.00E+000	0.00E+000	1.79E+001
Th-231	6.58E-001	4.63E-001	9.32E-001
PA-234	0.00E+000	0.00E+000	2.85E-001
PA-234M	2.58E+001	1.99E+001	3.26E+001
U-234	4.94E+001	2.55E+001	4.16E+001
U-235	4.52E-001	4.45E-001	2.18E-001
U238	1.40E+001	1.20E+000	1.18E+000
AM-241	0.00E+000	0.00E+000	1.55E-001

112

CANBERRA

Analysis Results Header 11/04/2002 10:30:36 AM Page 1

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**********************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S       *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
```

Report Generated On : 11/04/2002 10:30:36 AM

RIN Number : 03S0007
Analytical Batch ID : 0210224732
Line Item Code : RC10B019

Filename: A:\G1900078.CNF

Sample Number : 03S0007-020.001
Lab Sample Number : CMLS-1847
Sample Receipt Date : 10/22/2002
Sample Volume Received : 1.37E+002 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.370E+002 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 10/08/2002 10:11:00 AM
Acquisition Started : 10/23/2002 2:45:00 PM

Count Time : 57600.0 seconds
Real Time : 57646.6 seconds
Dead Time : 0.08 %

B991

RLC Survey Area E

Medical Locations

35, 40, 41, 42, 43, 45

Energy Calibration Used Done On : 10/01/02
Energy = -0.204 + 0.250*ch + -5.33E-008*ch^2 + 5.11E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/23/02
Efficiency Geometry ID : 03S0007-020.001

Analyzed By: Marilyn Umbaugh Date: 11/4/02

Reviewed By: Sean Stanfield Date: 11/4/02

113

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0007-020.001

Analytical Batch ID : 0210224732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1847

Geometry ID : 03S0007-020.001

Filename: A:\G1900078.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	1.04E+001	7.13E-001	8.67E-001
CS-137	0.00E+000	0.00E+000	6.86E-002
TL-208	2.09E-001	3.83E-002	5.89E-002
PO-210	3.71E+003	2.62E+003	4.31E+003
BI-212	7.19E-001	6.39E-001	1.06E+000
PB-212	4.81E-001	3.08E-002	4.64E-002
BI-214	5.36E-001	1.20E-001	2.56E-001
PB-214	4.74E-001	5.22E-002	9.01E-002
RA-226	0.00E+000	0.00E+000	8.06E-001
AC-228	5.58E-001	1.22E-001	2.07E-001
TH-230	0.00E+000	0.00E+000	4.43E+000
Th-231	5.41E-001	7.40E-002	1.93E-001
PA-234	0.00E+000	0.00E+000	6.60E-002
PA-234M	7.58E+000	4.27E+000	6.95E+000
U-234	1.82E+001	7.03E+000	1.14E+001
U-235	5.80E-001	3.39E-002	4.99E-002
U238	5.49E+000	2.89E-001	2.16E-001
AM-241	3.07E-002	1.20E-002	3.43E-002

114

CANBERRA

Analysis Results Header 11/4/2002 8:52:35 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 11/4/2002 8:52:35 AM

RIN Number : 03S0007
Analytical Batch ID : 0210224732
Line Item Code : RC10B019

Filename: A:\G1900079.CNF

Sample Number : 03S0007-022.001
Lab Sample Number : CMLS-1852
Sample Receipt Date : 10/23/2002
Sample Volume Received : 2.20E+001 Grams

B991
RLC Survey Area E
Location 44

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.200E+001 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 10/8/2002 10:15:00 AM
Acquisition Started : 10/24/2002 1:26:20 PM

Count Time : 57600.0 seconds
Real Time : 57648.2 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 10/1/02
Energy = -0.204 + 0.250*ch + -5.33E-008*ch^2 + 5.11E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 10/23/02
Efficiency Geometry ID : 03S0007-022.001

Analyzed By: Sheri Chambers Date: 11/04/02

Reviewed By: Sean Stanfield Date: 11/05/02

115

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0007-022.001

Analytical Batch ID : 0210224732

Sample Type (Result Identifier): G19

Lab Sample Number : CMLS-1852

Geometry ID : 03S0007-022.001

Filename: A:\G1900079.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	6.45E+001	3.61E+000	3.71E+000
CS-137	4.93E-001	1.02E-001	2.22E-001
TL-208	7.51E-001	1.99E-001	3.22E-001
PO-210	1.47E+004	6.50E+003	1.96E+004
BI-212	3.96E+000	1.17E+000	3.17E+000
PB-212	1.91E+000	1.35E-001	2.44E-001
BI-214	1.47E+000	3.76E-001	6.68E-001
PB-214	1.19E+000	1.74E-001	4.06E-001
RA-226	5.53E+001	9.95E+000	2.60E+000
AC-228	0.00E+000	0.00E+000	1.02E+000
TH-230	0.00E+000	0.00E+000	2.01E+001
Th-231	1.38E+001	8.36E-001	8.65E-001
PA-234	0.00E+000	0.00E+000	3.17E-001
PA-234M	3.37E+001	2.26E+001	3.10E+001
U-234	4.76E+002	3.82E+001	5.12E+001
U-235	1.57E+001	5.02E-001	1.61E-001
U238	1.19E+001	1.18E+000	1.12E+000
AM-241	7.08E-001	1.15E-001	1.68E-001

CANBERRA

Analysis Results Header 12/19/2002 9:52:45 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 12/19/2002 9:52:45 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900006.CNF

B991
RCC Survey Area E
Med. Locations
57, 58, 59, 60

Sample Number : 03S0061-021.001
Lab Sample Number : CMLS-2070
Sample Receipt Date : 12/9/2002
Sample Volume Received : 4.63E+001 GRAM

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 4.630E+001 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 10:00:00 AM
Acquisition Started : 12/17/2002 1:53:49 PM

Count Time : 57600.0 seconds
Real Time : 57647.4 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 10/1/02
Energy = -0.204 + 0.250*ch + -5.33E-008*ch^2 + 5.11E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 12/19/02
Efficiency Geometry ID : 03S0061-021.001

Analyzed By: Sean Stanfield Date: 12/19/02

Reviewed By: Sheri Chambers Date: 12/19/02

117

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-021.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2070

Geometry ID : 03S0061-021.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900006.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	1.57E+001	1.13E+000	1.39E+000
CS-137n	0.00E+000	0.00E+000	1.03E-001
TL-208n	2.02E-001	3.25E-002	5.81E-002
PO-210in	6.72E+003	2.36E+003	5.55E+003
BI-212n	5.05E-001	4.90E-001	8.14E-001
PB-212n	4.84E-001	3.95E-002	6.54E-002
BI-214n	4.72E-001	1.26E-001	4.48E-001
PB-214n	3.69E-001	5.41E-002	1.31E-001
RA-226n	0.00E+000	0.00E+000	1.60E+000
AC-228n	2.24E-001	1.40E-001	3.01E-001
TH-230n	0.00E+000	0.00E+000	4.98E+000
Th-231n	3.32E-001	1.12E-001	2.10E-001
PA-234Mn	0.00E+000	0.00E+000	1.02E+001
PA-234n	0.00E+000	0.00E+000	7.67E-002
U-234n	2.22E+001	7.52E+000	1.20E+001
U-235	3.10E-001	4.27E-002	9.90E-002
U238	1.67E+000	2.76E-001	3.12E-001
AM-241	6.81E-002	2.50E-002	3.99E-002

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

113

CANBERRA

Analysis Results Header 12/31/2002 8:45:46 AM Page 1

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*************************************************************************
*****       G A M M A   S P E C T R U M   A N A L Y S I S       *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
*************************************************************************
```

Report Generated On : 12/31/2002 8:45:46 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : N/A

B991
RLC Survey Area E
Media Sample Location
47

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900009.CNF

Sample Number : 03S0061-024.001
Lab Sample Number : CMLS-2115
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.57E+001 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.570E+001 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 1:17:00 PM
Acquisition Started : 12/27/2002 8:28:20 PM

Count Time : 28800.0 seconds
Real Time : 28822.3 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 12/30/02
Efficiency Geometry ID : 03S0061-024.001

Analyzed By: Sheri Chambers Date: 12/31/02

Reviewed By: Sean Stanfield Date: 12/31/02

119

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-024.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2115

Geometry ID : 03S0061-024.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900009.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40n	4.13E+001	3.59E+000	3.64E+000
CS-137n	0.00E+000	0.00E+000	3.75E-001
TL-208n	3.51E-001	1.02E-001	2.09E-001
PO-210in	0.00E+000	0.00E+000	3.59E+004
BI-212n	0.00E+000	0.00E+000	5.28E+000
PB-212n	6.98E-001	1.95E-001	3.06E-001
BI-214n	8.37E-001	3.65E-001	5.85E-001
PB-214n	6.28E-001	2.28E-001	3.78E-001
RA-226n	0.00E+000	0.00E+000	2.82E+000
AC-228n	7.99E-001	4.37E-001	1.11E+000
TH-230n	0.00E+000	0.00E+000	1.85E+001
Th-231n	0.00E+000	0.00E+000	1.14E+000
PA-234Mn	0.00E+000	0.00E+000	3.92E+001
PA-234n	0.00E+000	0.00E+000	2.95E-001
U-234n	0.00E+000	0.00E+000	4.88E+001
U-235	4.21E-001	1.95E-001	1.74E-001
U238	2.63E+000	1.37E+000	1.15E+000
AM-241	4.56E-001	1.06E-001	1.59E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 12/31/2002 9:55:02 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 12/31/2002 9:55:02 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900010.CNF

B991
RLC Survey Area E
Media Sample Location
49

Sample Number : 03S0061-025.001
Lab Sample Number : CMLS-2117
Sample Receipt Date : 12/9/2002
Sample Volume Received : 6.60E+000 GRAM

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 6.600E+000 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 1:25:00 PM
Acquisition Started : 12/30/2002 8:35:30 AM

Count Time : 28800.0 seconds
Real Time : 28822.8 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 12/31/02
Efficiency Geometry ID : 03S0061-025.001

Analyzed By: Sean Stanfield Date: 12/31/02

Reviewed By: Sheri Chambers Date: 12/31/02

12

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-025.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2117

Geometry ID : 03S0061-025.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900010.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	7.24E+001	8.48E+000	1.06E+001
CS-137n	0.00E+000	0.00E+000	9.05E-001
TL-208n	5.62E-001	2.04E-001	4.36E-001
PO-210in	5.10E+004	5.00E+004	8.34E+004
BI-212n	0.00E+000	0.00E+000	1.25E+001
PB-212n	1.12E+000	2.46E-001	4.93E-001
BI-214n	1.03E+000	4.22E-001	1.13E+000
PB-214n	7.71E-001	3.54E-001	8.52E-001
RA-226n	0.00E+000	0.00E+000	8.09E+000
AC-228n	0.00E+000	0.00E+000	1.99E+000
TH-230n	0.00E+000	0.00E+000	4.01E+001
Th-231n	1.45E+000	8.84E-001	1.92E+000
PA-234Mn	0.00E+000	0.00E+000	8.55E+001
PA-234n	0.00E+000	0.00E+000	6.42E-001
U-234n	8.85E+001	5.68E+001	9.30E+001
U-235	2.12E+000	2.76E-001	5.00E-001
U238	8.09E+000	2.07E+000	2.32E+000
AM-241	4.32E-001	1.97E-001	3.15E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

122

CANBERRA

Analysis Results Header 12/31/2002 11:24:20 AM Page 1

```
**********************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S       *****
** Canberra Mobile Laboratory Services**
**********************************************************************
```

Report Generated On : 12/31/2002 11:24:20 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900011.CNF

B991
RLC Survey Area E
Media Sample Location
48

Sample Number : 03S0061-026.001
Lab Sample Number : CMLS-2121
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.34E+001 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.340E+001 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 1:17:39 PM
Acquisition Started : 12/30/2002 5:17:39 PM

Count Time : 28800.0 seconds
Real Time : 28823.1 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 12/31/02
Efficiency Geometry ID : 03S0061-026.001

Analyzed By: Sean Stanfield Date: 12/31/02

Reviewed By: Sheri Chambers Date: 12/31/02

123

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-026.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2121

Geometry ID : 03S0061-026.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900011.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40n	4.92E+001	4.60E+000	5.28E+000
CS-137n	0.00E+000	0.00E+000	4.59E-001
TL-208n	4.20E-001	2.10E-001	3.39E-001
PO-210in	0.00E+000	0.00E+000	4.23E+004
BI-212n	1.96E+000	1.43E+000	3.08E+000
PB-212n	1.11E+000	2.51E-001	3.88E-001
BI-214n	9.63E-001	3.75E-001	6.80E-001
PB-214n	8.38E-001	3.01E-001	5.62E-001
RA-226n	0.00E+000	0.00E+000	2.94E+000
AC-228n	1.64E+000	7.16E-001	1.32E+000
TH-230n	0.00E+000	0.00E+000	2.27E+001
Th-231n	3.47E+000	1.38E+000	9.74E-001
PA-234Mn	0.00E+000	0.00E+000	4.62E+001
PA-234n	0.00E+000	0.00E+000	3.47E-001
U-234n	1.30E+002	2.01E+001	4.44E+001
U-235	4.42E+000	5.68E-001	1.82E-001
U238	5.32E+000	8.45E-001	1.52E+000
AM-241	3.47E-001	7.60E-002	1.85E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 1/2/2003 2:07:44 PM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 1/2/2003 2:07:44 PM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900012.CNF

B991
RLC Survey Area E
Media Sample Location
46

Sample Number : 03S0061-027.001
Lab Sample Number : CMLS-2122
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.09E+001 GRAM

Result Identifier : N/A

Peak Locate Threshold : 2.00
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.090E+001 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 1:17:00 PM
Acquisition Started : 12/31/2002 7:03:04 AM

Count Time : 28800.0 seconds
Real Time : 28832.1 seconds
Dead Time : 0.11 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/2/03
Efficiency Geometry ID : 03S0061-027.001

Analyzed By: Sean Stanfield Date: 1/2/03

Reviewed By: Phil Sanderson Date: 1/2/03

12

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-027.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2122

Geometry ID : 03S0061-027.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900012.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	5.55E+001	5.21E+000	5.74E+000
CS-137n	2.11E-001	1.09E-001	2.60E-001
TL-208n	4.87E-001	1.50E-001	3.10E-001
PO-210in	0.00E+000	0.00E+000	5.00E+004
BI-212n	0.00E+000	0.00E+000	8.14E+000
PB-212n	1.35E+000	1.76E-001	3.53E-001
BI-214n	1.54E+000	3.48E-001	6.82E-001
PB-214n	1.15E+000	3.47E-001	6.60E-001
RA-226n	0.00E+000	0.00E+000	4.02E+000
AC-228n	8.65E-001	8.48E-001	1.42E+000
TH-230n	0.00E+000	0.00E+000	2.84E+001
Th-231n	1.11E+001	2.75E-001	1.30E+000
PA-234Mn	2.72E+001	1.67E+001	3.62E+001
PA-234n	0.00E+000	0.00E+000	4.59E-001
U-234n	3.01E+002	4.29E+001	6.75E+001
U-235	1.23E+001	3.38E-001	2.49E-001
U238	9.89E+000	1.58E+000	2.15E+000
AM-241	7.41E-001	9.86E-002	2.09E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 1/7/2003 8:52:30 AM Page 1

```
*************************************************************************
*****        G A M M A   S P E C T R U M   A N A L Y S I S        *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
*************************************************************************
```

Report Generated On : 1/7/2003 8:52:30 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900015.CNF

B991
RLC Survey Area E
Media Sample Location
53

Sample Number : 03S0061-030.001
Lab Sample Number : CMLS-2137
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.46E+001 GRAM

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.460E+001 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 10/5/2002 9:48:00 AM
Acquisition Started : 1/6/2003 2:27:23 PM

Count Time : 28800.0 seconds
Real Time : 28822.4 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/7/03
Efficiency Geometry ID : 03S0061-030.001

Analyzed By: Sheri Chambers Date: 1/7/03

Reviewed By: Sean Stanfield Date: 1/7/03

127

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-030.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2137

Geometry ID : 03S0061-030.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900015.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	4.16E+001	4.28E+000	5.20E+000
CS-137n	0.00E+000	0.00E+000	4.00E-001
TL-208n	4.47E-001	1.86E-001	2.96E-001
PO-210in	0.00E+000	0.00E+000	3.87E+004
BI-212n	0.00E+000	0.00E+000	6.20E+000
PB-212n	1.04E+000	2.04E-001	3.03E-001
BI-214n	1.13E+000	4.20E-001	7.17E-001
PB-214n	9.48E-001	1.97E-001	4.43E-001
RA-226n	0.00E+000	0.00E+000	5.33E+000
AC-228n	5.88E-001	5.01E-001	1.06E+000
TH-230n	0.00E+000	0.00E+000	2.04E+001
Th-231n	1.75E+000	4.61E-001	8.42E-001
PA-234Mn	0.00E+000	0.00E+000	4.33E+001
PA-234n	0.00E+000	0.00E+000	3.25E-001
U-234n	7.36E+001	3.20E+001	5.13E+001
U-235	2.01E+000	1.78E-001	3.30E-001
U238	6.03E+000	8.18E-001	1.10E+000
AM-241	4.69E-001	1.22E-001	1.87E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

128

CANBERRA

Analysis Results Header 1/8/2003 11:25:41 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 1/8/2003 11:25:41 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900016.CNF

B991
RLC Survey Area E
Med. Sample Location
54

Sample Number : 03S0061-031.001
Lab Sample Number : CMLS-2138
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.35E+001 GRAM

Result Identifier : NA

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.350E+001 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 9:52:00 AM
Acquisition Started : 1/7/2003 7:03:49 AM

Count Time : 28800.0 seconds
Real Time : 28822.2 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/8/03
Efficiency Geometry ID : 03S0061-031.001

Analyzed By: Sheri Chambers Date: 1/8/03

Reviewed By: Sean Stanfield Date: 1/8/03

129

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-031.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2138

Geometry ID : 03S0061-031.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900016.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	4.34E+001	4.01E+000	4.19E+000
CS-137n	0.00E+000	0.00E+000	4.36E-001
TL-208n	4.41E-001	1.11E-001	2.47E-001
PO-210in	0.00E+000	0.00E+000	4.01E+004
BI-212n	0.00E+000	0.00E+000	6.24E+000
PB-212n	5.49E-001	2.21E-001	3.56E-001
BI-214n	6.49E-001	3.63E-001	5.90E-001
PB-214n	3.76E-001	3.29E-001	5.19E-001
RA-226n	0.00E+000	0.00E+000	3.18E+000
AC-228n	0.00E+000	0.00E+000	1.72E+000
TH-230n	0.00E+000	0.00E+000	2.00E+001
Th-231n	5.47E-001	3.28E-001	9.15E-001
PA-234Mn	0.00E+000	0.00E+000	4.44E+001
PA-234n	0.00E+000	0.00E+000	3.33E-001
U-234n	0.00E+000	0.00E+000	5.37E+001
U-235	1.47E+000	9.76E-002	1.97E-001
U238	5.29E+000	1.02E+000	1.12E+000
AM-241	3.62E-001	1.16E-001	1.82E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 1/10/2003 8:00:47 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 1/10/2003 8:00:47 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900018.CNF

B991
Media Sample Location
55
RLC Survey Area E

Sample Number : 03S0061-032.001
Lab Sample Number : CMLS-2139
Sample Receipt Date : 12/9/2002
Sample Volume Received : 8.70E+000 GRAM

Result Identifier : NA

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 8.700E+000 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 10/5/2002 10:00:00 AM
Acquisition Started : 1/8/2003 7:15:18 AM

Count Time : 28800.0 seconds
Real Time : 28822.6 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/9/03
Efficiency Geometry ID : 03S0061-032.001

Analyzed By: Sean Stanfield Date: 1/10/03

Reviewed By: Sheri Chambers Date: 1/10/03

131

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-032.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2139

Geometry ID : 03S0061-032.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\MOD\F1900018.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	6.81E+001	6.57E+000	7.46E+000
CS-137n	0.00E+000	0.00E+000	6.78E-001
TL-208n	5.88E-001	1.66E-001	3.55E-001
PO-210in	3.69E+004	2.57E+004	4.20E+004
BI-212n	0.00E+000	0.00E+000	1.01E+001
PB-212n	1.09E+000	2.09E-001	4.77E-001
BI-214n	1.08E+000	3.31E-001	7.76E-001
PB-214n	8.21E-001	3.67E-001	7.38E-001
RA-226n	0.00E+000	0.00E+000	3.52E+001
AC-228n	0.00E+000	0.00E+000	2.67E+000
TH-230n	0.00E+000	0.00E+000	3.20E+001
Th-231n	0.00E+000	0.00E+000	1.56E+000
PA-234Mn	0.00E+000	0.00E+000	6.61E+001
PA-234n	0.00E+000	0.00E+000	4.96E-001
U-234n	7.81E+001	3.25E+001	7.93E+001
U-235	2.85E+000	5.83E-001	3.89E-001
U238	9.12E+000	4.59E+000	2.07E+000
AM-241	9.33E-001	1.87E-001	2.77E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 1/9/2003 9:05:49 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 1/9/2003 9:05:49 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\ORIG\F1900019.CNF

B991
RLC Survey Area E
Media Sample Location
56

Sample Number : 03S0061-033.001
Lab Sample Number : CMLS-2140
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.08E+001 grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.080E+001 grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 10:04:00 AM
Acquisition Started : 1/8/2003 3:55:24 PM

Count Time : 28800.0 seconds
Real Time : 28822.8 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/9/03
Efficiency Geometry ID : 03S0061-033.001

Analyzed By: Sheri Chambers Date: 1/9/03

Reviewed By: Sean Stanfield Date: 1/9/03

133

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-033.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2140

Geometry ID : 03S0061-033.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\ORIG\F1900019.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/grams)	2-Sigma Uncertainty (pCi/grams)	MDA (pCi/grams)
K-40n	5.15E+001	5.15E+000	5.86E+000
CS-137n	0.00E+000	0.00E+000	5.61E-001
TL-208n	6.18E-001	2.75E-001	4.42E-001
PO-210in	0.00E+000	0.00E+000	5.07E+004
BI-212n	4.31E+000	3.35E+000	5.52E+000
PB-212n	7.30E-001	1.56E-001	3.47E-001
BI-214n	1.50E+000	5.75E-001	1.00E+000
PB-214n	1.22E+000	2.51E-001	5.75E-001
RA-226n	0.00E+000	0.00E+000	5.20E+000
AC-228n	0.00E+000	0.00E+000	1.41E+000
TH-230n	0.00E+000	0.00E+000	2.61E+001
Th-231n	0.00E+000	0.00E+000	1.56E+000
PA-234Mn	0.00E+000	0.00E+000	5.52E+001
PA-234n	0.00E+000	0.00E+000	4.15E-001
U-234n	3.38E+001	3.84E+001	6.43E+001
U-235	1.87E+000	4.29E-001	3.22E-001
U238	5.69E+000	2.99E+000	1.46E+000
AM-241	0.00E+000	0.00E+000	2.22E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 1/13/2003 9:55:21 AM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 1/13/2003 9:55:21 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094732
Line Item Code : RC10B019

Filename: S:\GENIE2K\CAMFILES\LI012(F)\ORIG\F1900020.CNF

B991

Sample Number : 03S0061-034.001
Lab Sample Number : CMLS-2195
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.24E+001 GRAM

RLC Survey Area E
Media Sample Location
50

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.240E+001 GRAM
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 9:25:00 AM
Acquisition Started : 1/10/2003 3:08:19 PM

Count Time : 28000.0 seconds
Real Time : 28023.2 seconds
Dead Time : 0.08 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.246 + 0.250*ch + -3.36E-008*ch^2 + 2.64E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/13/03
Efficiency Geometry ID : 03S0061-034.001

Analyzed By: Sheri Chambers Date: 1/13/03

Reviewed By: Marilyn Umbaugh Date: 1/13/03

135

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-034.001

Analytical Batch ID : 0212094732

Sample Type (Result Identifier): F19

Lab Sample Number : CMLS-2195

Geometry ID : 03S0061-034.001

Filename: S:\GENIE2K\CAMFILES\LI012(F)\ORIG\F1900020.CNF

Detector Name: BEGE4732

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAM)	2-Sigma Uncertainty (pCi/GRAM)	MDA (pCi/GRAM)
K-40n	0.00E+000	0.00E+000	1.00E+001
CS-137n	2.61E-001	1.17E-001	2.78E-001
TL-208n	4.73E-001	1.30E-001	2.64E-001
PO-210in	0.00E+000	0.00E+000	4.44E+004
BI-212n	0.00E+000	0.00E+000	6.81E+000
PB-212n	9.56E-001	2.44E-001	3.78E-001
BI-214n	8.62E-001	4.58E-001	7.43E-001
PB-214n	7.48E-001	2.38E-001	6.75E-001
RA-226n	0.00E+000	0.00E+000	1.40E+001
AC-228n	0.00E+000	0.00E+000	2.02E+000
TH-230n	0.00E+000	0.00E+000	2.65E+001
Th-231n	1.42E+001	8.63E-001	1.16E+000
PA-234Mn	0.00E+000	0.00E+000	5.80E+001
PA-234n	0.00E+000	0.00E+000	4.35E-001
U-234n	3.76E+002	4.48E+001	6.17E+001
U-235	1.58E+001	3.60E-001	2.28E-001
U238	1.19E+001	5.64E+000	1.49E+000
AM-241	6.58E-001	1.41E-001	2.10E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 1/13/2003 10:09:12 AM Page 1

```
**********************************************************************
*****       G A M M A   S P E C T R U M   A N A L Y S I S        *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
```

Report Generated On : 1/13/2003 10:09:12 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094453
Line Item Code : RC10B019

B991
RCC Survey Area E
Media Sample Location
51

Filename: S:\GENIE2K\CAMFILES\LI009(D)\ORIG\D1900026.CNF

Sample Number : 03S0061-035.001
Lab Sample Number : CMLS-2196
Sample Receipt Date : 12/9/2002
Sample Volume Received : 1.05E+001 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.050E+001 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 9:30:00 AM
Acquisition Started : 1/10/2003 4:09:15 PM

Count Time : 28800.0 seconds
Real Time : 28802.6 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.349 + 0.250*ch + -1.33E-008*ch^2 + 8.37E-013*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/13/03
Efficiency Geometry ID : 03S0061-035.001

Analyzed By: Sheri Chambers Date: 1/13/03

Reviewed By: Marilyn Umbaugh Date: 1/13/03

131

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-035.001

Analytical Batch ID : 0212094453

Sample Type (Result Identifier): D19

Lab Sample Number : CMLS-2196

Geometry ID : 03S0061-035.001

Filename: S:\GENIE2K\CAMFILES\LI009(D)\ORIG\D1900026.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40n	1.04E+001	2.11E+000	2.33E+000
CS-137n	0.00E+000	0.00E+000	2.91E-001
TL-208n	0.00E+000	0.00E+000	3.16E-001
PO-210in	0.00E+000	0.00E+000	2.81E+004
BI-212n	0.00E+000	0.00E+000	4.24E+000
PB-212n	5.58E-001	1.51E-001	2.25E-001
BI-214n	0.00E+000	0.00E+000	6.53E-001
PB-214n	4.01E-001	1.88E-001	2.94E-001
RA-226n	0.00E+000	0.00E+000	2.52E+000
AC-228n	0.00E+000	0.00E+000	1.20E+000
TH-230n	0.00E+000	0.00E+000	1.33E+001
Th-231n	2.07E+000	4.91E-001	7.27E-001
PA-234Mn	0.00E+000	0.00E+000	3.24E+001
PA-234n	0.00E+000	0.00E+000	2.43E-001
U-234n	0.00E+000	0.00E+000	4.85E+001
U-235	2.03E+000	1.35E-001	1.56E-001
U238	2.78E+000	8.67E-001	1.24E+000
AM-241	7.15E-001	1.04E-001	1.31E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

CANBERRA

Analysis Results Header 1/13/2003 10:34:25 AM Page 1

```
**********************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S      *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
```

Report Generated On : 1/13/2003 10:34:25 AM

RIN Number : 03S0061
Analytical Batch ID : 0212094453
Line Item Code : RC10B019

B991

Filename: S:\GENIE2K\CAMFILES\LI009(D)\ORIG\D1900027.CNF

Sample Number : 03S0061-036.001
Lab Sample Number : CMLS-2197
Sample Receipt Date : 12/9/2002
Sample Volume Received : 9.30E+000 GRAMS

RLC Survey Area E
Media Sample Location
52

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 9.300E+000 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 12/5/2002 9:40:00 AM
Acquisition Started : 1/11/2003 10:41:59 AM

Count Time : 28800.0 seconds
Real Time : 28802.6 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 12/27/02
Energy = -0.349 + 0.250*ch + -1.33E-008*ch^2 + 8.37E-013*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 1/13/03
Efficiency Geometry ID : 03S0061-036.001

Analyzed By: Sheri Chambers Date: 1/13/03

Reviewed By: Marilyn Umbaugh Date: 1/13/03

139

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 03S0061-036.001

Analytical Batch ID : 0212094453

Sample Type (Result Identifier): D19

Lab Sample Number : CMLS-2197

Geometry ID : 03S0061-036.001

Filename: S:\GENIE2K\CAMFILES\LI009(D)\ORIG\D1900027.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40n	7.78E+000	2.53E+000	3.60E+000
CS-137n	1.53E-001	8.60E-002	1.87E-001
TL-208n	1.50E-001	1.36E-001	2.25E-001
PO-210in	0.00E+000	0.00E+000	3.30E+004
BI-212n	0.00E+000	0.00E+000	4.99E+000
PB-212n	7.18E-001	3.21E-001	5.24E-001
BI-214n	4.56E-001	2.77E-001	4.43E-001
PB-214n	4.16E-001	1.32E-001	3.69E-001
RA-226n	0.00E+000	0.00E+000	2.22E+000
AC-228n	0.00E+000	0.00E+000	1.44E+000
TH-230n	0.00E+000	0.00E+000	1.39E+001
Th-231n	0.00E+000	0.00E+000	1.01E+000
PA-234Mn	0.00E+000	0.00E+000	3.46E+001
PA-234n	0.00E+000	0.00E+000	2.60E-001
U-234n	0.00E+000	0.00E+000	5.03E+001
U-235	5.94E-001	1.48E-001	1.37E-001
U238	2.79E+000	1.55E+000	1.00E+000
AM-241	5.32E-001	9.98E-002	1.35E-001

i - If Po-210 is detected in the spectrum. This peak may be the result of the interaction of Pb-206(n,n')which also produces a prompt gamma at 803 keV.

n - Non-contractual Nuclide

ATTACHMENT C-6

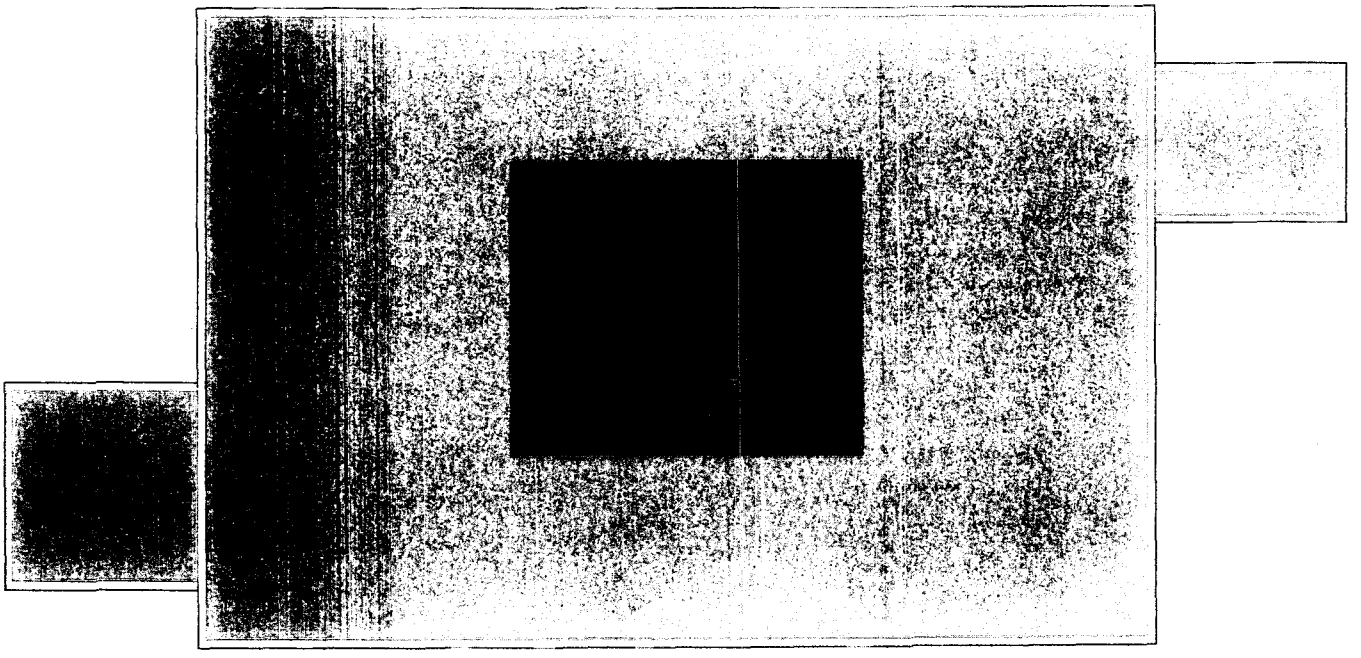
SURVEY AREA - F

Radiological Data Summary and Survey Maps

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: F **Survey Unit: N/A** **Classification: N/A**
Building: 985
Survey Unit Description: 985 Floor Plan
Total Area: N/A sq. m. **Total Floor Area: 210 sq. m.**

B985



- Survey Area A 1472 sq. m.
- Survey Area B 934 sq. m.
- Survey Area C 889 sq. m.
- Survey Area D 500 sq. m.
- Survey Area E 1446 sq. m.
- Survey Area F 210 sq. m.

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/985-C

April 11, 2002

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1250
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	10/10/02
Bkg	0 cpmα	Bkg	0.2 cpmα	Bkg	2 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	21.30 %
MDA	20 dpmα	MDA	20 dpmα	MDA	44 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1250
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	10/10/02
Bkg	36 cpmβ	Bkg	33 cpmβ	Bkg	562 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	28.30 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	399 dpmβ

Survey Type: Contamination
Building: 985
Location: Area F WF
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/17/02 Time: 1300

RCT: S. Voorhies / S. Voorhies [redacted]
Print name Signature

RCT: J.B. Abney / J.B. Abney
Print name Signature

PRN/REN # : N/A

Comments: Survey of floors and walls at locations < 2m. All locations were scanned and readings greater than investigation limits are shown on pg. 2.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	0	0	28	805
2	See map for location	0	4	0	346
3	See map for location	0	80	0	823
4	See map for location	0	4	14	406
5	See map for location	0	0	0	893
6	See map for location	0	12	0	498
7	See map for location	0	12	0	0
8	See map for location	3	0	5	544
9	See map for location	0	0	14	689
10	See map for location	3	16	19	230
11	See map for location	0	0	42	0
12	See map for location	0	0	33	844
13	See map for location	0	0	61	152
14	See map for location	0	0	14	819
15	See map for location	0	4	9	660
16	See map for location	0	32	5	0
17	See map for location	0	0	5	477
18	See map for location	3	44	47	350
19	See map for location	0	32	19	678
20	See map for location	0	0	19	0
21	See map for location	0	4	0	477
22	See map for location	0	24	0	681
23	See map for location	0	0	0	678
24	See map for location	0	8	14	855
25	See map for location	0	16	9	0
26	See map for location	0	0	23	378
27	See map for location	0	0	9	809
28	See map for location	0	0	28	816
29	See map for location	6	20	33	900
30	See map for location	0	0	33	487

Date Reviewed: 7-18-00 **RS Supervision:** Teresa Johnston / Teresa Johnston [redacted]
Print Name Signature

145

RADIOLOGICAL SAFETY

Scan Investigation Sheet

985 Area F WF Reconnaissance Level Characterization

All scans were less than the investigation limits of 225 dpmα and 11250 dpmβ except as noted.

Location

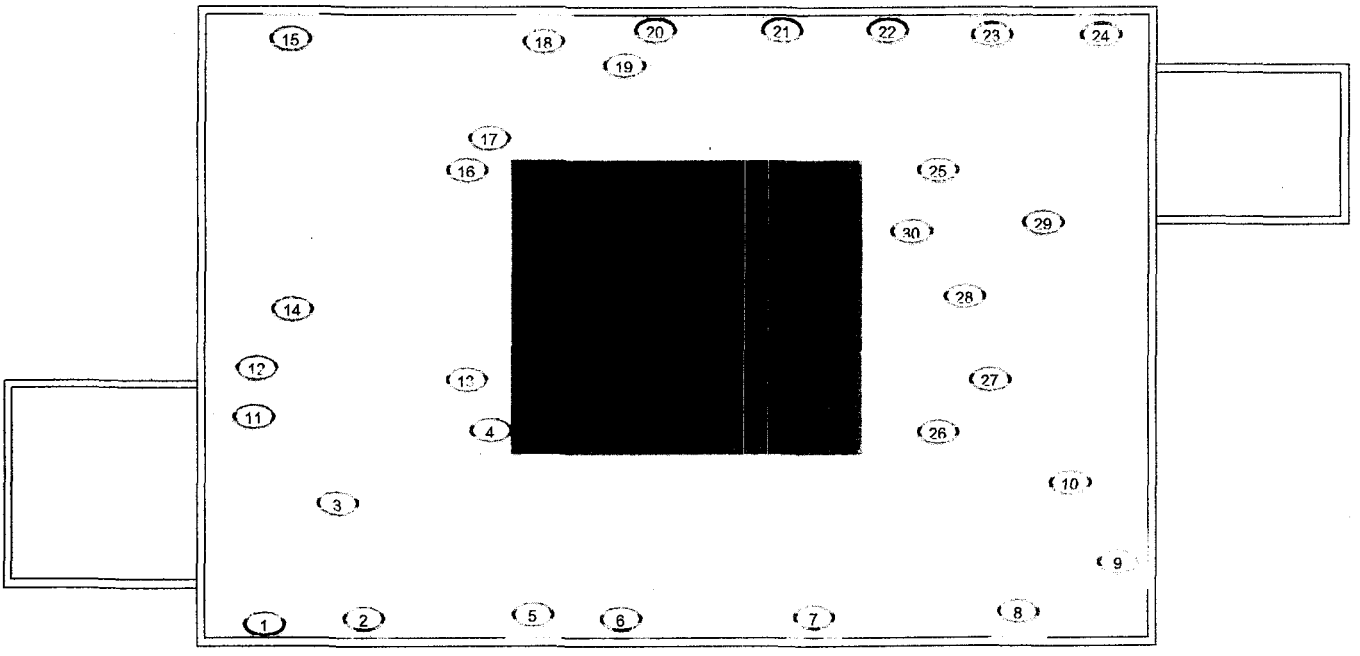
	dpmα	dpmβ		dpmα	dpmβ
1	<225	<11250	26	<225	<11250
2	<225	<11250	27	<225	<11250
3	<225	<11250	28	<225	<11250
4	<225	<11250	29	<225	<11250
5	<225	<11250	30	<225	<11250
6	<225	<11250			
7	<225	<11250			
8	<225	<11250			
9	<225	<11250			
10	<225	<11250			
11	<225	<11250			
12	<225	<11250			
13	<225	<11250			
14	<225	<11250			
15	<225	<11250			
16	<225	<11250			
17	<225	<11250			
18	<225	<11250			
19	<225	<11250			
20	<225	<11250			
21	<225	<11250			
22	<225	<11250			
23	<225	<11250			
24	<225	<11250			
25	<225	<11250			

146

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: F **Survey Unit: N/A** **Classification: N/A**
Building: 985
Survey Unit Description: <2m Floor & Walls
Total Area: N/A sq. m. **Total Floor Area: 210 sq. m.**

B985



Scan Area

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/985-FW-SC July 31, 2002

147

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1260
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	8/27/02
Bkg	0 cpmα	Bkg	0.2 cpmα	Bkg	7 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.10 %
MDA	20 dpmα	MDA	20 dpmα	MDA	68 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1260
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	8/27/02
Bkg	36 cpmβ	Bkg	33 cpmβ	Bkg	513 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.70 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	364 dpmβ

Survey Type: Contamination
Building: 985
Location: 991 Area F WC
Purpose: Reconnaissance Level Characterization

RWP #: N/A

Date: 7/17/02 Time: 1400

RCT: M. Givens [signature] [redacted]
Print name Signature

RCT: B. Gallagher [signature]
Print name Signature

PRN/REN # : N/A
Comments: Survey on walls at height >2 meters and ceiling where possible.

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable		Total	
		Alpha	Beta	Alpha	Beta
1	See map for location	0	0	14	572
2	See map for location	0	20	0	747
3	See map for location	0	20	0	613
4	See map for location	3	32	0	697
5	See map for location	0	0	14	751
6	See map for location	6	16	77	566
7	See map for location	3	4	181	603
8	See map for location	0	0	41	401
9	See map for location	0	0	23	418
10	See map for location	0	24	0	535

Scans were not required on these locations. All 1 minute pats were less than the investigative limits 225 dpm α and 11250 dpm β.

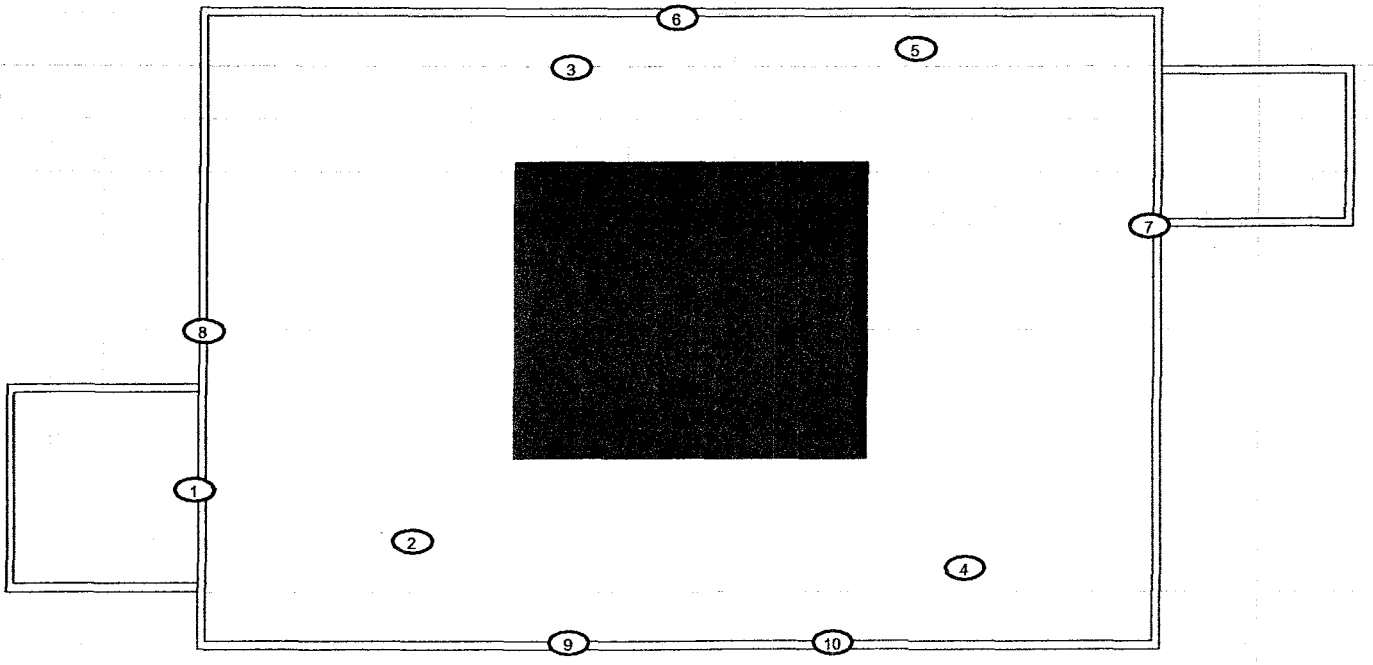
Date Reviewed: 7-18-02 **RS Supervision:** Teresa Johnston [signature] [redacted]
Print Name Signature

1 of 8

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: F **Survey Unit: N/A** **Classification: N/A**
Building: 985
Survey Unit Description: >2m Ceiling & Walls
Total Area: N/A sq. m. **Total Floor Area: 210 sq. m.**

B985



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER HILL

MAP ID: 02-0355/985-CW July 31, 2002

1 of 9

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	851	Serial #	1260
Cal Due	7/25/02	Cal Due	10/29/02	Cal Due	8/27/02
Bkg	0 cpmα	Bkg	0.2 cpmα	Bkg	1 cpmα
Efficiency	33.00 %	Efficiency	33.00 %	Efficiency	22.10 %
MDA	20 dpmα	MDA	20 dpmα	MDA	33 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	704	Serial #	905	Serial #	1260
Cal Due	10/30/02	Cal Due	7/26/02	Cal Due	8/27/02
Bkg	36 cpmβ	Bkg	33 cpmβ	Bkg	596 cpmβ
Efficiency	25.00 %	Efficiency	25.00 %	Efficiency	29.70 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	391 dpmβ

Survey Type: Contamination
Building: 985
Location: 991 Area F Equip
Purpose: Reconnaissance Level Characterization
RWP #: N/A
Date: 7/16/02 Time: 1400
RCT: A. Conley (Print name) April K Conley (Signature) [redacted]
RCT: J. Absher (Print name) (Signature) [redacted]

PRN/REN # : N/A
Comments: Survey on various pieces of equipment. Smears were counted on 7/17/02

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	Fire Phone	9	0	9	0
2	Fire system piping	0	0	5	0
3	Local plenum panel	0	16	14	0
4	Local control station	3	0	23	0
5	Bldg. Air duct	0	4	14	0
6	Elect. Panel	0	0	14	0
7	Elect. Panel	3	48	0	0
8	Pump Housing	0	8	14	0
9	Breaker Panel	0	36	23	0
10	Control Panel	3	4	23	0
11	Supply Fan Belt Housing	0	0	14	0
12	Supply Fan	9	8	9	0
13	Plenum Exh. Motor Housing	0	40	14	0
14	Local control station	0	4	5	0
15	Bldg. Air duct	3	12	68	0
16	Plenum Exhaust Fan Housing	0	0	14	0
17	Plenum Exhaust Fan Control	0	0	18	0
18	Compressor Air Dryer	0	24	5	0
19	Air Compressor	0	32	5	0
20	Air Compressor Belt Housing	3	0	9	0
21	Guard Phone	0	0	9	0
22	Bldg. Air duct	0	0	9	0
23	Bldg. Air duct	0	4	0	0
24	Control Panel	0	16	5	0
25	Transfer Pump Switch	0	0	0	0

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
26	Tank	0	0	14	0
27	Tank Manway	3	4	14	0
28	Tank Piping	0	0	0	0
29	Bldg. Air duct	3	0	23	0
30	Check Valve	3	40	36	0

Scans were not required on this equipment. All 1 minute pats were less than the investigative limits 225 dpm α and 11250 dpm β.

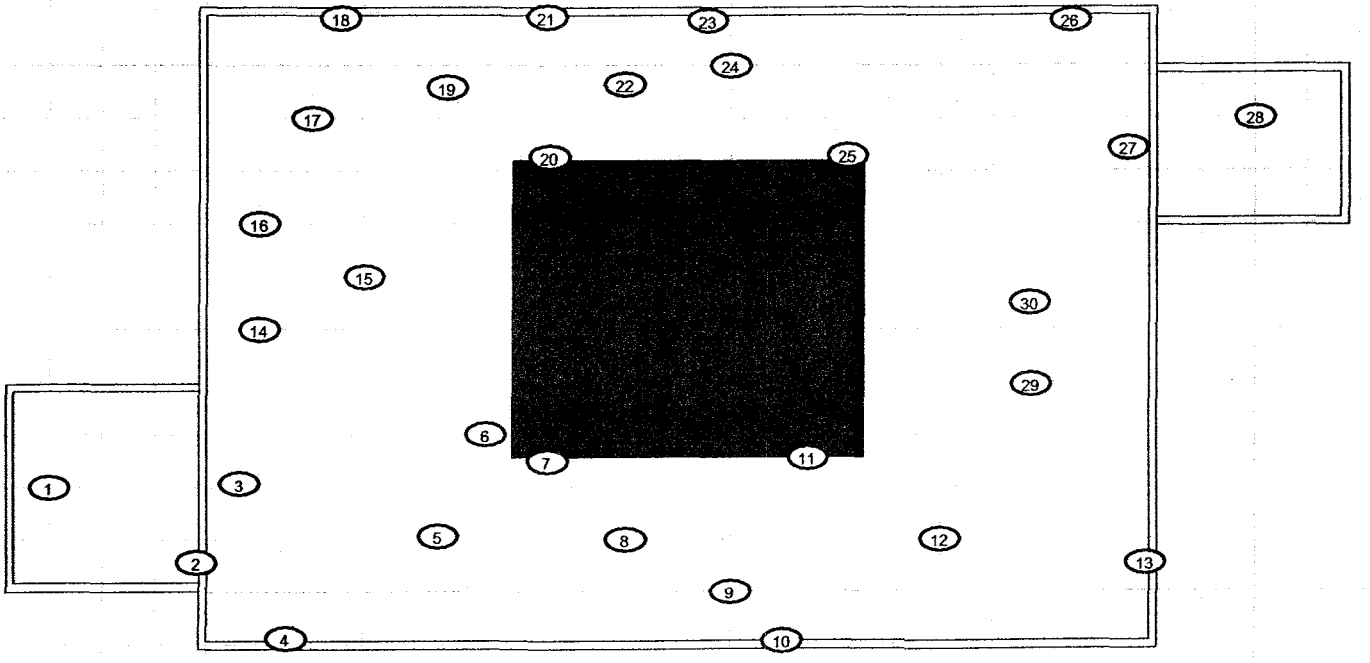
Date Reviewed: 7-18-02 **RS Supervision:** Teresa Johnston (Print Name) Teresa Johnston (Signature) [redacted]

150

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: F **Survey Unit: N/A** **Classification: N/A**
Building: 985
Survey Unit Description: Equipment Location
Total Area: N/A sq. m. **Total Floor Area: 210 sq. m.**

B985



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER HILL

MAP ID: 02-0355/985-EQ

July 31, 2002

151

ATTACHMENT C-7

SURVEY UNIT 991-B-009

Radiological Data Summary and Survey Maps

SURVEY UNIT 991-B-009
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B991 Exterior

153

Total Surface Activity Measurements

	65 Number Required	70 Number Obtained	
MIN	-13.1		dpm/100 cm^2
MAX	86.6		dpm/100 cm^2
MEAN	32.5		dpm/100 cm^2
STD DEV	23.0		dpm/100 cm^2
TRANSURANIC $DCGL_W$	100		dpm/100 cm^2

Removable Activity Measurements

	65 Number Required	70 Number Obtained	
MIN	1.2		dpm/100 cm^2
MAX	5.8		dpm/100 cm^2
MEAN	3.4		dpm/100 cm^2
STD DEV	1.8		dpm/100 cm^2
TRANSURANIC $DCGL_W$	20		dpm/100 cm^2

154

SURVEY UNIT 991-B-009
TSA - DATA SUMMARY

Instrument ID#:	Manufacturer:	Model:	Serial #:	Cal Due Date:	Alpha Eff. (c/d):	MDC (dpm/100cm^2)
1	NE Electra	DP-6	1250	10/10/02	0.213	48.0
2	NE Electra	DP-6	1379	11/20/02	0.173	48.0
3	NE Electra	DP-6	1366	02/01/03	0.204	48.0
4	NE Electra	DP-6	1271	02/01/03	0.211	48.0
5	NE Electra	DP-6	2352	02/07/02	0.238	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[3]
1	2	6.7	38.7	4.0	23.1	19.5
2	3	14.7	72.1	0.7	3.4	52.8
3	2	18.3	105.8	5.3	30.6	86.6
4	1	12.0	56.3	3.3	15.5	37.1
5	3	34.0	166.7	1.3	6.4	0.0
6	4	1.3	6.2	3.0	14.2	-13.1
7	4	9.3	44.1	2.0	9.5	24.8
8	3	12.0	58.8	2.7	13.2	39.6
9	3	17.3	84.8	1.3	6.4	65.6
10	1	10.7	50.2	4.0	18.8	31.0
11	1	2.0	9.4	1.3	6.1	-9.8
12	4	18.7	88.6	0.0	0.0	69.4
13	2	8.7	50.3	6.7	38.7	31.1
14	2	10.7	61.8	6.0	34.7	42.6
15	2	12.0	69.4	6.7	38.7	50.1
16	2	8.7	50.3	4.7	27.2	31.1
17	3	11.3	55.4	2.0	9.8	36.2
18	1	14.1	66.2	1.3	6.1	47.0
19	1	8.0	37.6	2.7	12.7	18.3
20	4	5.3	25.1	8.1	38.4	5.9
21	3	12.7	62.3	2.7	13.2	43.0
22	2	10.0	57.8	8.7	50.3	38.6
23	2	7.3	42.2	3.3	19.1	23.0
24	2	8.0	46.2	4.3	24.9	27.0
25	2	8.0	46.2	6.0	34.7	27.0
26	2	11.3	65.3	3.3	19.1	46.1
27	1	3.3	15.5	0.0	0.0	-3.7
28	2	23.3	134.7	4.0	23.1	23.0
29	3	12.7	62.3	2.0	9.8	43.0
30	1	8.7	40.8	2.0	9.4	21.6
31	3	10.0	49.0	2.0	9.8	29.8
32	3	13.3	65.2	2.7	13.2	46.0
33	2	16.0	92.5	4.0	23.1	73.3
34	2	6.7	38.7	8.0	46.2	19.5
35	3	11.3	55.4	3.3	16.2	36.2
36	2	9.3	53.8	4.0	23.1	34.5
37	3	26.0	127.5	2.7	13.2	23.0
38	2	16.0	92.5	6.7	38.7	73.3
39	3	10.0	49.0	2.7	13.2	29.8
40	1	10.0	46.9	1.3	6.1	27.7

155

SURVEY UNIT 991-B-009
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]
41	1	6.0	28.2	1.3	6.1	8.9
42	4	20.0	94.8	0.7	3.3	75.6
43	2	13.3	76.9	7.3	42.2	57.7
44	3	10.0	49.0	5.3	26.0	29.8
45	1	8.7	40.8	0.7	3.3	21.6
46	2	21.3	123.1	6.7	38.7	23.0
47	3	9.8	48.0	1.7	8.3	28.8
48	2	16.7	96.5	7.3	42.2	77.3
49	2	10.0	57.8	4.7	27.2	38.6
50	1	6.7	31.5	0.8	3.8	12.2
51	3	12.7	62.3	5.3	26.0	43.0
52	1	52.7	247.4	2.0	9.4	0.0
53	4	12.7	60.2	0.7	3.3	41.0
54	4	8.0	37.9	0.0	0.0	18.7
55	3	11.3	55.4	4.8	23.5	36.2
56	2	12.7	73.4	6.7	38.7	54.2
57	2	7.3	42.2	3.3	19.1	23.0
58	1	33.0	154.9	2.0	9.4	0.0
59	1	8.7	40.8	2.7	12.7	21.6
60	3	10.0	49.0	4.7	23.0	29.8
61	2	11.3	65.3	8.0	46.2	46.1
62	4	2.0	9.5	5.3	25.1	-9.7
63	3	14.7	72.1	2.0	9.8	52.8
64	1	13.3	62.4	2.0	9.4	43.2
65	1	12.0	56.3	3.4	16.0	37.1
66	1	8.0	37.6	2.0	9.4	18.3
67	2	18.0	104.0	5.3	30.6	84.8
68	2	14.0	62.8	6.7	30.0	45.1
69	2	4.7	21.1	7.3	32.7	3.4
70	2	18.7	83.9	6.9	30.9	66.2
71	2	38.0	219.7	1.3	7.5	0.0
72	2	26.3	152.0	3.3	19.1	0.0
73	2	60.0	346.8	1.8	10.4	0.0

1 - Average LAB used to subtract from Gross Sample Activity

19.2	Sample LAB Average
MIN	-13.1
MAX	86.6
MEAN	32.5
SD	23.0
Transuranic $DCGL_W$	**100**

QC Measurements

3 QC	1	9.3	43.7	1.3	6.1	32.7
30 QC	4	8.7	41.2	3.3	15.6	30.2
1 QC	3	3.3	16.2	3.3	16.2	5.2
22 QC	1	5.3	24.9	1.3	6.1	13.9

1 - Average QC LAB used to subtract from Gross Sample Activity

11.0	QC LAB Average
MIN	5.2
MAX	32.7
MEAN	20.5
Transuranic $DCGL_W$	**100**

156

SURVEY UNIT 991-B-009
TSA - DATA SUMMARY

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1]

TSA Data Summary Comments

Initial Sample Net Activity results:

Location	Initial Survey result (dpm/100cm^2)	Action/Investigation
5	147.4	metal flashing - coupon collected and analyzed - See Note 1 below
52	228.2	metal flashing - coupon collected and analyzed - See Note 1 below
58	135.7	metal flashing - coupon collected and analyzed - See Note 1 below
73	327.6	metal flashing - coupon collected and analyzed - See Note 1 below
71	200.4	media sample collected and analyzed - See Note 2 below
72	132.8	media sample collected and analyzed - See Note 2 below
28	115.5	media sample collected and analyzed - See Note 3 below
37	108.2	media sample collected and analyzed - See Note 3 below
46	103.9	media sample collected and analyzed - See Note 3 below

1.) A metal coupon sample was collected from location 73 and analyzed using the Canberra ISOCS system. No transuranic isotopes were detected. Metal flashing activity was determined to be from uranium and naturally occuring isotopes.
The Sample Net Activity for each location is below the Uranium $DCGL_W$ limits (5000 dpm/100cm2).
On this basis, transuranic values for locations 5, 52, 58, and 73 are reported as zero (O) net activity in the TSA Data Summary.
All survey results are less than the applicable DCGLs, therefore, no further investigation is required.

2.) Media samples were collected from locations 71 and 72 and analyzed using the Canberra ISOCS system.
No transuranic isotopes were detected.
The media sample results were converted to dpm/100cm^2 as calculated on the Media Sample Conversion sheet.
The calculated uranium value of 38 dpm/100cm^2 is below the $DCGL_W$ limits (5000 dpm/100cm^2) for uranium.
On this basis, transuranic values for locations 71 and 72 are reported as zero (O) net activity in the TSA Data Summary.
All survey results are less than the applicable DCGLs, therefore, no further investigation is required.

3.) Media samples were collected from locations 37 and 46 and analyzed using the Canberra ISOCS system.
The media sample results were converted to dpm/100cm^2 as calculated on the Media Sample Conversion sheet.
The calculated uranium value of 120.3 dpm/100cm^2 is below the $DCGL_W$ limit (5000 dpm/100cm^2) for uranium.
The calculated transuranic value of 23.0 dpm/100cm^2 is below the $DCGL_W$ limit (100 dpm/100cm^2) for transuranics and is reported in the TSA Data Summary for locations 28, 37, and 46.
All survey results are less than the applicable DCGLs, therefore, no further investigation is required.

4.) Locations 71, 72, and 73 were taken as part of an investigation to document elevated scan count rates.

157

SURVEY UNIT 991-B-009
RSC - DATA SUMMARY

Instrument ID#:	Manufacturer:	Model:	Serial #:	Cal Due Date	Bckground (cpm)	Alpha Eff. (c/d):	MDC ($dpm/100cm^2$)
1	Eberline	SAC-4	824	10/1/02	0.1	0.33	9.0
2	Eberline	SAC-4	851	10/29/02	0.2	0.33	9.0
3	Eberline	SAC-4	963	1/3/03	0.0	0.33	9.0
4	Eberline	SAC-4	966	11/6/02	0.1	0.33	9.0

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity ($dpm/100\ cm^2$)
1	1	1	1.2
2	2	2	2.4
3	3	3	4.5
4	4	4	5.8
5	1	1	1.2
6	2	2	2.4
7	3	3	4.5
8	4	4	5.8
9	1	1	1.2
10	2	2	2.4
11	3	3	4.5
12	4	4	5.8
13	1	1	1.2
14	2	2	2.4
15	3	3	4.5
16	4	4	5.8
17	1	1	1.2
18	2	2	2.4
19	3	3	4.5
20	4	4	5.8
21	1	1	1.2
22	2	2	2.4
23	3	3	4.5
24	4	4	5.8
25	1	1	1.2
26	2	2	2.4
27	3	3	4.5
28	4	4	5.8
29	1	1	1.2
30	2	2	2.4
31	3	3	4.5
32	4	4	5.8
33	1	1	1.2
34	2	2	2.4
35	3	3	4.5
36	4	4	5.8
37	1	1	1.2
38	2	2	2.4
39	3	3	4.5
40	4	4	5.8
41	1	1	1.2

158

SURVEY UNIT 991-B-009
RSC - DATA SUMMARY

Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
42	2	2	2.4
43	3	3	4.5
44	4	4	5.8
45	1	1	1.2
46	2	2	2.4
47	3	3	4.5
48	4	4	5.8
49	1	1	1.2
50	2	2	2.4
51	3	3	4.5
52	4	4	5.8
53	1	1	1.2
54	2	2	2.4
55	3	3	4.5
56	4	4	5.8
57	1	1	1.2
58	2	2	2.4
59	3	3	4.5
60	4	4	5.8
61	1	1	1.2
62	2	2	2.4
63	3	3	4.5
64	4	4	5.8
65	1	1	1.2
66	2	2	2.4
67	3	3	4.5
68	4	4	5.8
69	1	1	1.2
70	2	2	2.4

MIN	1.2
MAX	5.8
MEAN	3.4
SD	1.8
Transuranic $DCGL_W$	**20**

151

100

991-B-009
Media Sample Conversion Sheet

Media Sample Conversion Calculation Sheet

LOCATION DESCRIPTION	SAMPLE LOCATION NUMBER	SITE SAMPLE ID	NUCLIDE	pCi/g[1]	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (in^2)	INDIVIDUAL NUCLIDE ($dpm/100cm^2$)	ESTIMATED MDA ($dpm/100cm^2$)	URANIUM TOTAL ($dpm/100cm^2$)	TRANSURANIC TOTAL ($dpm/100cm^2$)
B991 Exterior	71,72	O2S0222-002.001	U-235	0.243	0.197	20	24.5	7	6		
			U-238	1.110	1.200			31	34	**38.0**	
			Pu-239 Pu-240	0.000	1.611			0	45		
			Am-241	0.000	0.216			0	6		**0.0**
B991 Exterior	37,46	O2S0228-003.001	U-235	0.368	0.197	28	24.5	14	8		
			U-238	2.690	1.200			106	47	**120.3**	
			Pu-239 Pu-240	0.516	0.486			20	19		
			Am-241	0.069	0.065			3	3		**23.0**

1 - Critical Level test criterion were used in this analysis. If the peak area was less than L_C(critical level), then a "not detected" or "zero" decision was made.

CANBERRA

Analysis Results Header 8/29/2002 2:37:21 PM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 8/29/2002 2:37:21 PM

RIN Number : 02S0228
Analytical Batch ID : 0208284453
Line Item Code : RC10B019

B 991 Exterior
Locations 37 + 46
Media Samples

Filename: A:\OBJ00605.CNF

Sample Number : 02S0228-003.001
Lab Sample Number : CMLS-1651
Sample Receipt Date : 8/28/2002
Sample Volume Received : 2.80E+001 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.800E+001 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/27/2002 1:30:00 PM
Acquisition Started : 8/28/2002 2:13:35 PM

Count Time : 86400.0 seconds
Real Time : 86409.9 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/29/02
Efficiency Geometry ID : 02S0228-003.001

Analyzed By: Marilyn Umbaugh Date: 8/29/02

Reviewed By: Larry Umbaugh Date: 9/3/02

161

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0228-003.001

Analytical Batch ID : 0208284453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1651

Geometry ID : 02S0228-003.001

Filename: A:\OBJ00605.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	1.36E+001	1.15E+000	1.31E+000
CS-137	1.08E+000	8.03E-002	9.23E-002
TL-208	5.48E-001	9.09E-002	1.46E-001
PO-210	6.32E+003	4.60E+003	7.57E+003
BI-212	2.18E+000	7.26E-001	1.12E+000
PB-212	1.47E+000	4.62E-002	7.38E-002
BI-214	1.51E+000	1.31E-001	1.72E-001
PB-214	1.82E+000	9.69E-002	1.24E-001
RA-226	0.00E+000	0.00E+000	9.20E-001
AC-228	1.63E+000	2.07E-001	3.11E-001
TH-230	0.00E+000	0.00E+000	6.54E+000
Th-231	1.13E+000	2.00E-001	3.19E-001
PA-234	0.00E+000	0.00E+000	9.73E-002
PA-234M	0.00E+000	0.00E+000	1.07E+001
U-235	3.68E-001	4.00E-002	5.69E-002
U238/234	2.69E+000	4.14E-001	4.61E-001
AM-241	6.92E-002	3.99E-002	6.51E-002

162

CANBERRA

Analysis Results Header 8/23/2002 11:27:14 AM Page 1

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*************************************************************************
*****       G A M M A   S P E C T R U M   A N A L Y S I S         *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
*************************************************************************
```

Report Generated On : 8/23/2002 11:27:14 AM

RIN Number : 02S0222
Analytical Batch ID : 0208224453
Line Item Code : RC10B019

B 991 Extra
Locations 71, 72
Media Samples

Filename: A:\OBJ00594.CNF

Sample Number : 02S0222-002.001
Lab Sample Number : CMLS-1630
Sample Receipt Date : 8/22/2002
Sample Volume Received : 2.00E+001 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.000E+001 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/22/2002 9:50:00 AM
Acquisition Started : 8/23/2002 7:07:02 AM

Count Time : 7200.0 seconds
Real Time : 7200.7 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/23/02
Efficiency Geometry ID : 02S0222-002.001

Analyzed By: Phil Sanderson Date: 8/23/02

Reviewed By: Sheri Chambers Date: 8/23/02

163

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0222-002.001

Analytical Batch ID : 0208224453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1630

Geometry ID : 02S0222-002.001

Filename: A:\OBJ00594.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	8.11E+000	2.88E+000	3.65E+000
CS-137	3.86E-001	1.20E-001	2.54E-001
TL-208	3.11E-001	1.71E-001	2.59E-001
PO-210	0.00E+000	0.00E+000	2.37E+004
BI-212	0.00E+000	0.00E+000	3.93E+000
PB-212	7.48E-001	2.07E-001	2.88E-001
BI-214	8.65E-001	3.38E-001	5.38E-001
PB-214	8.18E-001	2.37E-001	4.21E-001
RA-226	0.00E+000	0.00E+000	3.18E+000
AC-228	0.00E+000	0.00E+000	1.32E+000
TH-230	0.00E+000	0.00E+000	1.83E+001
Th-231	0.00E+000	0.00E+000	1.13E+000
PA-234	0.00E+000	0.00E+000	2.87E-001
PA-234M	0.00E+000	0.00E+000	3.27E+001
U-235	2.43E-001	5.23E-002	1.97E-001
U238/234	1.11E+000	7.67E-001	1.20E+000
AM-241	0.00E+000	0.00E+000	2.16E-001

CANBERRA

Analysis Results Header 8/23/2002 10:43:17 AM Page 1

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**********************************************************************
*****      G A M M A   S P E C T R U M   A N A L Y S I S       *****
** C a n b e r r a  M o b i l e  L a b o r a t o r y  S e r v i c e s **
**********************************************************************
```

Report Generated On : 8/23/2002 10:43:17 AM

B991 Location 73

RIN Number : 02S0222
Analytical Batch ID : 0208224453
Line Item Code : RC10B019

Metal Coupon

Filename: A:\OBJ00593.CNF

Sample Number : 02S0222-001.001
Lab Sample Number : CMLS-1629
Sample Receipt Date : 8/22/2002
Sample Volume Received : 1.16E+001 GRAMS

Result Identifier : N/A

Peak Locate Threshold : 2.50
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 1.160E+001 GRAMS
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 8/22/2002 9:50:00 AM
Acquisition Started : 8/22/2002 3:02:27 PM

Count Time : 14400.0 seconds
Real Time : 14401.2 seconds
Dead Time : 0.01 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/23/02
Efficiency Geometry ID : 02S0222-001.001

Analyzed By: Phil Sanderson Date: 8/23/02

Reviewed By: Larry Umbaugh Date: 8/23/02

165

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02S0222-001.001

Analytical Batch ID : 0208224453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1629

Geometry ID : 02S0222-001.001

Filename: A:\OBJ00593.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

Analyte	Activity (pCi/GRAMS)	2-Sigma Uncertainty (pCi/GRAMS)	MDA (pCi/GRAMS)
K-40	0.00E+000	0.00E+000	6.69E+000
CS-137	0.00E+000	0.00E+000	3.63E-001
TL-208	0.00E+000	0.00E+000	4.05E-001
PO-210	0.00E+000	0.00E+000	3.87E+004
BI-212	0.00E+000	0.00E+000	6.04E+000
PB-212	0.00E+000	0.00E+000	3.78E-001
BI-214	0.00E+000	0.00E+000	7.47E-001
PB-214	0.00E+000	0.00E+000	6.02E-001
RA-226	3.43E+000	2.17E+000	3.78E+000
AC-228	0.00E+000	0.00E+000	1.43E+000
TH-230	0.00E+000	0.00E+000	2.32E+001
Th-231	0.00E+000	0.00E+000	1.23E+000
PA-234	0.00E+000	0.00E+000	3.87E-001
PA-234M	0.00E+000	0.00E+000	5.04E+001
U-235	0.00E+000	0.00E+000	2.34E-001
U238/234	1.44E+000	9.51E-001	1.46E+000
AM-241	0.00E+000	0.00E+000	2.83E-001

ATTACHMENT C-8

SURVEY UNIT 991-B-010

Radiological Data Summary and Survey Maps

SURVEY UNIT 991-B-010
RADIOLOGICAL DATA SUMMARY - PDS

Survey Unit Description: B985 (Exterior)

170

Total Surface Activity Measurements

	15 Number Required	15 Number Obtained	
MIN	12.1		dpm/100 cm^2
MAX[1]	86.1		dpm/100 cm^2
MEAN	41.6		dpm/100 cm^2
STD DEV	19.3		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15 Number Required	15 Number Obtained	
MIN	0.0		dpm/100 cm^2
MAX	4.5		dpm/100 cm^2
MEAN	0.9		dpm/100 cm^2
STD DEV	1.3		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

1 - The initial Sample Net Activity for locations 2 and 17 was 118.2 dpm/100cm^2 each. These two locations were re-surveyed after a decay period. The re-survey results are reported.

171

SURVEY UNIT 991-B-010
TSA - DATA SUMMARY

Manufacturer:	NE Electra	NE Electra	NE Electra	NE Electra
Model:	DP-6	DP-6	DP-6	DP-6
Instrument ID#:	7	8	9	10
Serial #:	394	1379	1250	1260
Cal Due Date:	1/12/03	11/20/02	10/10/02	2/21/03
Analysis Date:	7/29/02	7/29/02	7/29/02	8/26/02
Alpha Eff. (c/d):	0.226	0.173	0.223	0.219
Alpha Bkgd (cpm)	4.0	1.3	1.3	2.7
Sample Time (min)	1.5	1.5	1.5	1.5
LAB Time (min)	1.5	1.5	1.5	1.5
MDC (dpm/100cm^2)	48.0	48.0	48.0	48.0

Sample Location Number	Instrument ID#:	Sample Gross Counts (cpm)	Sample Gross Activity (dpm/100cm2)	LAB Gross Counts (cpm)	LAB Gross Activity (dpm/100cm2)	Sample Net Activity (dpm/100cm2)[1,2]
1	9	12.7	57.0	2.0	9.0	39.1
2	10	11.3	51.6	2.0	9.1	33.7
3	9	10.0	44.8	4.0	17.9	26.9
4	7	14.7	65.0	3.3	14.6	47.1
5	9	13.3	59.6	1.3	5.8	41.7
6	7	16.7	73.9	7.3	32.3	56.0
7	9	10.0	44.8	2.0	9.0	26.9
8	9	6.7	30.0	3.4	15.2	12.1
9	7	18.0	79.6	2.7	11.9	61.7
10	8	10.7	61.8	4.7	27.2	43.9
11	7	9.3	41.2	5.3	23.5	23.3
12	9	9.3	41.7	2.0	9.0	23.8
13	7	8.7	38.5	5.3	23.5	20.6
14	8	15.3	88.4	6.7	38.7	70.5
15	7	16.0	70.8	6.0	26.5	52.9
16	7	18.7	82.7	2.7	11.9	64.8
17	10	8.3	37.9	2.4	11.0	20.0
18	8	18.0	104.0	4.7	27.2	86.1
19	8	10.0	57.8	4.0	23.1	39.9
20	8	10.0	57.8	2.0	11.6	39.9

1 - Average LAB used to subtract from Gross Sample Activity

2 - The initial Sample Net Activity for locations 2 and 17 was 118.2 dpm/100cm^2 each. These two locations were re-surveyed after a decay period. The re-survey results are reported.

17.9	Sample LAB Average
MIN	12.1
MAX	86.1
MEAN	41.6
SD	19.3
Transuranic $DCGL_W$	100

QC Measurements

4 QC	8	14.7	85.0	6.0	34.7	44.5
16 QC	8	10.7	61.8	8.0	46.2	21.4

1 - Average QC LAB used to subtract from Gross Sample Activity

40.5	QC LAB Average
MIN	21.4
MAX	44.5
MEAN	32.9
Transuranic $DCGL_W$	100

172

SURVEY UNIT 991-B-010
RSC - DATA SUMMARY

Manufacturer:	Eberline	Eberline	Eberline	Eberline
Model:	SAC-4	SAC-4	SAC-4	SAC-4
Instrument ID#:	1	2	3	4
Serial #:	824	851	963	966
Cal Due Date:	10/1/02	10/29/02	1/3/03	11/6/02
Analysis Date:	7/29/02	7/29/02	7/29/02	7/29/02
Alpha Eff. (c/d):	0.33	0.33	0.33	0.33
Alpha Bkgd (cpm)	0.0	0.0	0.0	0.0
Sample Time (min)	2	2	2	2
Bkgd Time (min)	10	10	10	10
MDC (dpm/100cm^2)	9.0	9.0	9.0	9.0

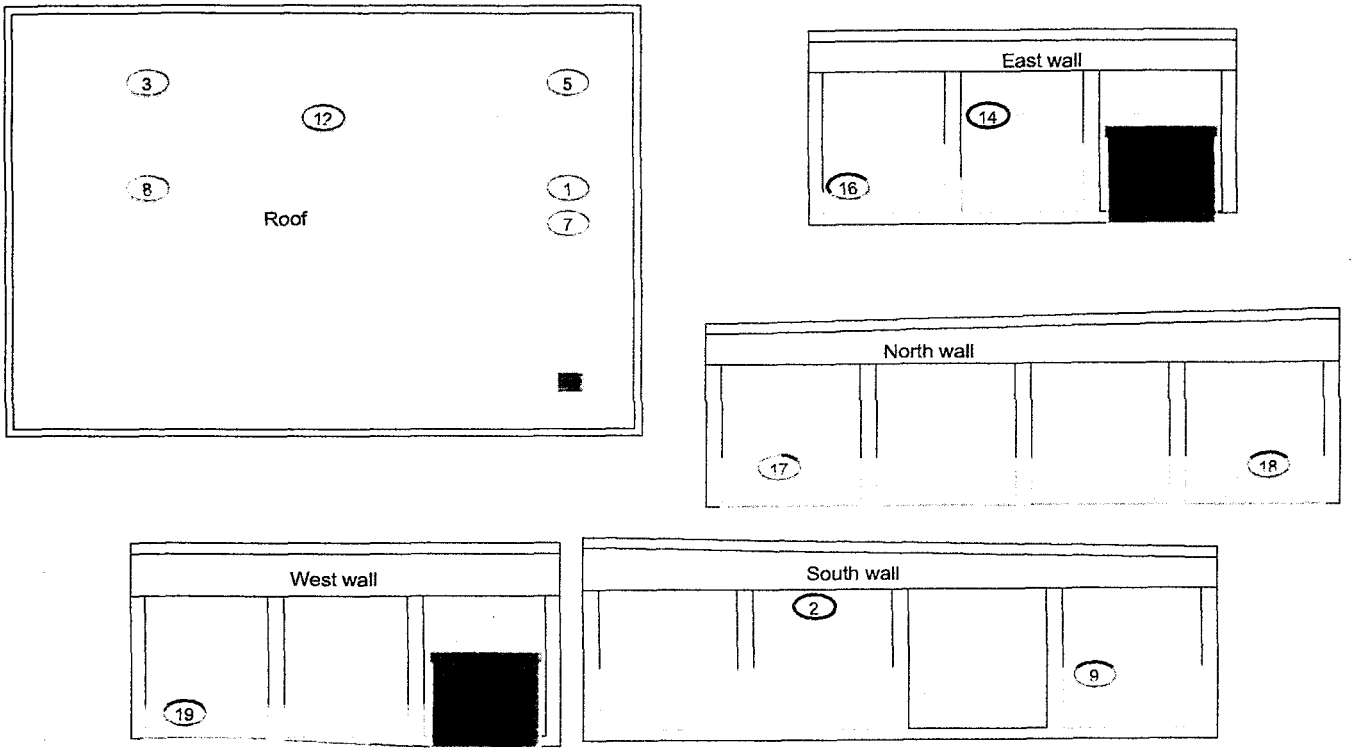
Sample Location Number	Instrument ID#	Gross Counts (cpm)	Net Activity (dpm/100 cm^2)
1	1	3.0	4.5
2	2	0.0	0.0
3	2	0.0	0.0
4	2	0.0	0.0
5	2	1.0	1.5
6	3	1.0	1.5
7	4	0.0	0.0
8	1	1.0	1.5
9	3	2.0	3.0
10	3	1.0	1.5
11	1	2.0	3.0
12	3	0.0	0.0
13	1	0.0	0.0
14	4	0.0	0.0
15	1	0.0	0.0
16	4	0.0	0.0
17	2	1.0	1.5
18	3	0.0	0.0
19	4	0.0	0.0
20	4	0.0	0.0
		MIN	0.0
		MAX	4.5
		MEAN	0.9
		SD	1.3
		Transuranic DCGL$_W$	**20**

173

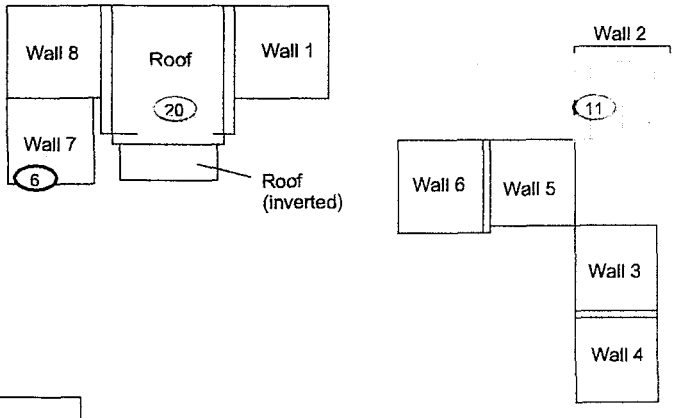
PRE-DEMOLITION SURVEY FOR 991 CLUSTER

Survey Area: B **Survey Unit: 991-B-010** **Classification: 2**
Building: 985
Survey Unit Description: Exterior of Building
Total Area: 653 sq. m. **Total Floor Area: 244 sq. m.**

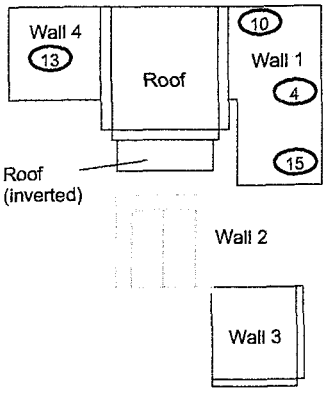
B985



West Airlock



East Airlock



Scan Area

SURVEY MAP LEGEND
- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): 7, 8
RCT ID #(s): 2, 3

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

KAISER-HILL

MAP ID: 02-0355/985-EX-SC August 7, 2002

ATTACHMENT C-9

991 BASEMENT SOIL SAMPLES
and
PRE & POST CORE SURVEYS
and
1999 B991 PLENUM SURVEYS
and
RSA SURVEYS OF BERYLLIUM SWIPES

Radiological Data Summary and Survey Maps

15

CANBERRA

Analysis Results Header 8/08/2002 1:33:13 PM Page 1

****
***** GAMMA SPECTRUM ANALYSIS *****
** Canberra Mobile Laboratory Services **
****

Report Generated On : 8/08/2002 1:33:13 PM

RIN Number : 02D1385
Analytical Batch ID : 0208054453
Line Item Code : RC10B019

8 dirt Samples from 991 basement core bores RMW 9/11/02

Filename: A:\OBJ00556.CNF

Sample Number : 02D1385-009.001
Lab Sample Number : CMLS-1556
Sample Receipt Date : 8/05/2002
Sample Volume Received : 2.28E+003 Grams

Result Identifier : N/A

Peak Locate Threshold : 2.00
Peak Locate Range (in channels) : 100 - 8192
Peak Area Range (in channels) : 100 - 8192
Identification Energy Tolerance : 1.000 keV

Sample (Final Aliquot Size) : 2.278E+003 Grams
Sample Quantity Error : 0.000E+000
Systematic Error Applied : 0.000E+000

Sample Taken On : 7/11/2002 1:00:00 PM
Acquisition Started : 8/05/2002 10:46:49 AM

Count Time : 86400.0 seconds
Real Time : 86441.6 seconds
Dead Time : 0.05 %

Energy Calibration Used Done On : 7/15/02
Energy = -0.192 + 0.250*ch + 8.53E-008*ch^2 + -8.15E-012*ch^3

Corrections Applied:
None

Efficiency Calibration Used Done On : 8/06/02
Efficiency Geometry ID : 02D1385-009.001

Analyzed By: Marilyn Umbaugh Date: 8/8/02

Reviewed By: Daniel Remington Date: 8/8/02

176

CANBERRA

****
***** Sample and QC Sample Results Summary *****
****

Site Sample ID : 02D1385-009.001

Analytical Batch ID : 0208054453

Sample Type (Result Identifier): OBJ

Lab Sample Number : CMLS-1556

Geometry ID : 02D1385-009.001

Filename: A:\OBJ00556.CNF

Detector Name: BEGE

MDA = Curie method as specified in Genie-2000 Customization Tools Manual Appendix B; Basic Algorithms.

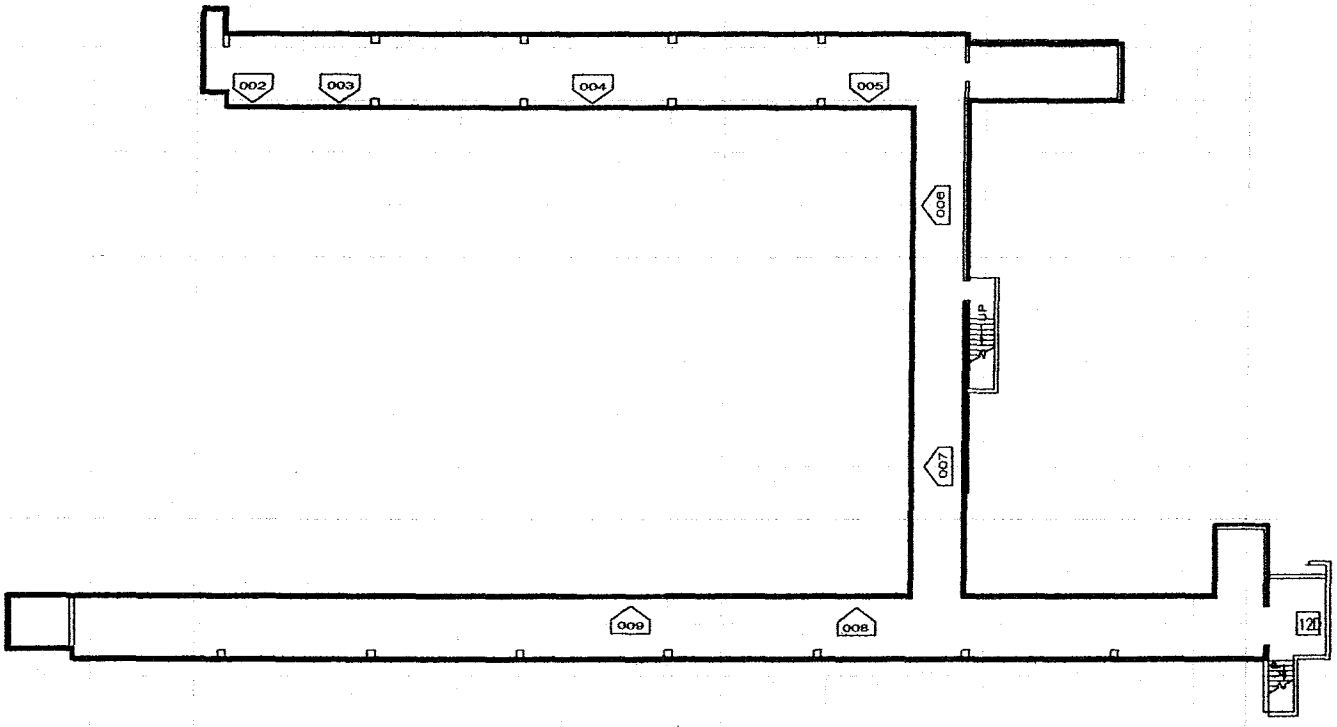
Analyte	Activity (pCi/Grams)	2-Sigma Uncertainty (pCi/Grams)	MDA (pCi/Grams)
K-40	1.44E+001	2.70E-001	1.43E-001
CS-137	0.00E+000	0.00E+000	1.01E-002
TL-208	2.71E-001	1.13E-002	1.48E-002
PO-210	0.00E+000	0.00E+000	8.95E+002
BI-212	6.84E-001	9.94E-002	1.50E-001
PB-212	7.56E-001	2.48E-002	1.28E-002
BI-214	6.10E-001	1.91E-002	2.44E-002
PB-214	6.42E-001	1.82E-002	2.09E-002
RA-226	0.00E+000	0.00E+000	3.00E-001
AC-228	7.72E-001	3.52E-002	5.24E-002
TH-230	2.11E+000	1.76E+000	3.00E+000
Th-231	4.73E-001	9.12E-002	1.32E-001
PA-234	0.00E+000	0.00E+000	2.71E-002
PA-234M	4.44E-001	5.18E-001	8.65E-001
U-235	9.10E-002	1.07E-002	1.85E-002
U238/234	8.49E-001	1.99E-001	1.31E-001
AM-241	0.00E+000	0.00E+000	2.88E-002

177

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: A **Survey Unit: N/A** **Classification: N/A**
Building: 991 Basement
Survey Unit Description: Core Drilling Samples
Total Area: N/A sq. m. **Total Floor Area: N/A sq. m.**

BLDG 991 BASEMENT FLOOR PLAN



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Core Drilling Samples
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s):

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp
THE ART OF TECHNOLOGY

KAISER HILL

MAP ID: 02-0355/991-BASE-Core September 5, 2002

175

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. Eberline	Mfg. Eberline	Mfg. NETech
Model SAC 4	Model BC-4	Model Electra
Serial # 810	Serial # 914	Serial # 1827
Cal Due 11-13-02	Cal Due 9-18-02	Cal Due 11-16-02
Bkg. 0.2	Bkg. 38.5	Bkg. 3.0
Efficiency 33%	Efficiency 25%	Efficiency 20.2
MDA 13	MDA 94	MDA 54
Mfg. NETech	Mfg.	Mfg.
Model Electra	Model	Model
Serial # 1827	Serial #	Serial #
Cal Due 11-16-02	Cal Due NA	Cal Due NA
Bkg. 781	Bkg.	Bkg.
Efficiency 329%	Efficiency	Efficiency
MDA 407	MDA	MDA

Survey Type: Contamination
Building: 991
Location: BASEMENT
Purpose: Sampling (Core)

RWP #: 02-991-0008

Date: 7/11/02 Time: 0730

RCT: SDVorhies / SDVorhies [redacted]
Print name Signature

RCT: NA / NA [redacted]
Print name Signature Emp. #

PRN/REN:

Comments: Pre Job Survey

SURVEY RESULTS

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1. Spot 3	<13	<94	<54	<407
2. 4	<13	<94	<54	<407
3. 5	<13	<94	<54	<407
4. 6	<13	<94	<54	<407
5. 10	<13	<94	<54	<407
6. 9	<13	<94	<54	<407
7. 8	<13	<94	<54	<407
8. 7	<13	<94	<54	<407
9. 2	<13	<94	<54	<407
10. Spot 1	<13	<94	<54	<407
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19				

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				
37.				
38.				

NA SDV 7/11/02

Date Reviewed: 7-11-02 RS Supervision: Teresa Johnston Teresa Johnston [redacted]

179

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. Eberline	Mfg. Eberline	Mfg. NETech
Model SAC-4	Model BC-4	Model Electra
Serial # 810	Serial # 914	Serial # 4337
Cal Due 11-13-02	Cal Due 9-18-02	Cal Due 10-15-02
Bkg. 0.1	Bkg. 38.4	Bkg. 4.0
Efficiency 33%	Efficiency 25%	Efficiency 22.3%
MDA <20 dpm	MDA <200	MDA <60 dpm
Mfg.	Mfg.	Mfg. NETech
Model	Model	Model Electra
Serial # N/A	Serial # N/A	Serial # 4337
Cal Due	Cal Due	Cal Due 10-15-02
Bkg.	Bkg.	Bkg. 829
Efficiency	Efficiency	Efficiency 31.7%
MDA	MDA	MDA 448 dpm

Survey Type: Contamination
Building: 991
Location: Basement of Tunnel
Purpose: Sampling (Core)
RWP #: 02-991-0008
Date: 7/12/02 Time: 0830
RCT: SDVoorhies / SDVoorhies [redacted]
Print name / Signature
RCT: N/A / N/A / N/A
Print name / Signature / Emp. #

~~PRN/REN~~: COC 02D1385 #001
Comments: Sample #s 02D1385#001.001 thru 02D1385-008.001

SURVEY RESULTS

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1. Spot 7 (C)	<20	<200	<60	<448
2. " " (W)	<20	<200	<60	<448
3. Spot 2 (C)	<20	<200	<60	<448
4. " " (W)	<20	<200	<60	<448
5. Spot 8 (C)	<20	<200	<60	<448
6. " " (W)	<20	<200	<60	<448
7. Spot 6 (C)	<20	<200	<60	<448
8. " " (W)	<20	<200	<60	<448
9. Spot 9 (C)	<20	<200	<60	<448
10. (W)	<20	<200	<60	<448
11. Spot 1 (C)	<20	<200	<60	<448
12. " " (W)	<20	<200	<60	<448
13. Bag of Samples	<20	<200	<60	<448
14.				
15.				
16.				
17.				
18.				
19				

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				
37.				
38.				

N/A SDV 7/12/02

N/A SDV 7/12/02

Date Reviewed: 7/12/02 RS Supervision: R. Morrick / for T. Johnston / [redacted]
Print Name / Signature

Rev. 02/00

180

 SDV 7-11-02

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	SAC-4	Model	SAC-4	Model	DP-6
Serial #	770	Serial #	na	Serial #	1513
Cal Due	7/25/02	Cal Due	na	Cal Due	10/23/02
Bkg	0.1 cpmα	Bkg	na cpmα	Bkg	3 cpmα
Efficiency	33 %	Efficiency	33 %	Efficiency	21.70 %
MDA	20 dpmα	MDA	20 dpmα	MDA	50 dpmα
Mfg.	Eberline	Mfg.	Eberline	Mfg.	NE Electra
Model	BC-4	Model	BC-4	Model	DP-6
Serial #	700	Serial #	na	Serial #	1513
Cal Due	12/13/02	Cal Due	na	Cal Due	10/23/02
Bkg	33.7 cpmβ	Bkg	na cpmβ	Bkg	403 cpmβ
Efficiency	25 %	Efficiency	25 %	Efficiency	29.60 %
MDA	200 dpmβ	MDA	200 dpmβ	MDA	325 dpmβ

Survey Type: Contamination
Building: 991
Location: basement
Purpose: sampling (Core)

RWP #: 02-991-0008

Date: 7/11/02 Time: 1130

RCT: S.D.Voorhies /S.D.Voorhies/ [redacted]
Print name Signature Emp. #

RCT: N/A / N/A / N/A
Print name Signature Emp. #

PRN/REN #: N/A
Comments:

SURVEY RESULTS

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
1	Sample #3	<20	<200	<50	<325
2	Sample #3	<20	<200	<50	<325
3	Sample#4	<20	<200	<50	<325
4	Sample#4	<20	<200	<50	<325
5	Sample#5	<20	<200	<50	<325
6	Sample#5	<20	<200	<50	<325
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Swipe #	Location / Description Results in DPM/100sq.cm	Removable Alpha	Removable Beta	Total Alpha	Total Beta
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

SDV 7/11/02

Date Reviewed: 7-11-02 **RS Supervision:** Teresa Johnston Teresa Johnston [redacted]
Print Name Signature

181

ORIGINAL 1 of 4 , RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. eberline	Mfg. eberline	Mfg. NE TECH	Survey Type:
Model SAC-4	Model BC-4	Model electra	Building: 991 Plenum
Serial # 841	Serial # 832	Serial # 232	Location: Upstream Side
Cal Due 1-13-00	Cal Due 3-27-00	Cal Due 4-21-00	Purpose: Survey for BE OK Sprinklers
Bkg. .011	Bkg. 42	Bkg. <5.0 <484	PRL# :
Efficiency 33%	Efficiency 25%	Efficiency 21% β 20%	RWP #: 99-991-0082
MDA 12 dpm	MDA 100 dpm	MDA 66 dpm 356 dpm	
			Date: 12-17-99 Time: 1530
Mfg.	Mfg.	Mfg.	
Model	Model	Model	RCT: Dennis / [signature] / [redacted]
Serial #	Serial #	Serial #	Print name / Signature / Emp. #
Cal Due	Cal Due	Cal Due	
Bkg.	Bkg.	Bkg.	RCT: / /
Efficiency	Efficiency	Efficiency	Print name / Signature / Emp. #
MDA	MDA	MDA	

Comments:

SURVEY RESULTS

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Fixed Alpha	Fixed Beta	Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Fixed Alpha	Fixed Beta
1. Filters Upstream	<12	<100	<66	<356	20. Floor Hepa Side	<12	<100	<66	<356
2. ↓	<12	<100	<66	<356	21. ↓	<12	<100	<66	<356
3.	<12	<100	<66	<356	22.	<12	<100	<66	<356
4.	<12	<100	<66	<356	23.	<12	<100	<66	<356
5.	<12	<100	<66	<356	24.	<12	<100	<66	<356
6.	<12	<100	<66	<356	25.	<12	<100	<66	<356
7.	<12	<100	<66	<356	26.	<12	<100	<66	<356
8.	<12	<100	<66	<356	27.	<12	<100	<66	<356
9.	<12	<100	<66	<356	28. ↓	<12	<100	<66	<356
10.	<12	<100	<66	<356	29. Impingement Box	<12	<100	<66	<356
11.	<12	<100	<66	<356	30. ↓	<12	<100	<66	<356
12.	<12	<100	<66	<356	31.	<12	<100	<66	<356
13.	<12	<100	<66	<356	32.	<12	<100	<66	<356
14.	<12	<100	<66	<356	33.	<12	<100	<66	<356
15. ↓	<12	<100	<66	<356	34.	<12	<100	<66	<356
16. Floor Hepa Side	<12	<100	<66	<356	35.	<12	<100	<66	<356
17. ↓	<12	<100	<66	<356	36.	<12	<100	<66	<356
18.	<12	<100	<66	<356	37.	<12	<100	<66	<356
19 ↓	<12	<100	<66	<356	38. ↓	<12	<100	<66	<356

Date Reviewed: 12/21/99 RS Supervision: K. Gyelord / [signature] / [redacted]

Print Name Signature

182

2069

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL SAFETY

Drawing Showing Survey Points

Alpha/Beta

Description/Location Results in DPM/100 cm²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
39. Impingement Floor	<12	<100	<66	<356
40.	<12	<100	<66	<356
41.	<12	<100	<66	<356
42.	<12	<100	<66	<356
43.	<12	<100	<66	<356
44.	<12	<100	<66	<356
45.	<12	<100	<66	<356
46.	<12	<100	<66	<356
47.	<12	<100	<66	<356
48.	<12	<100	<66	<356
49.	<12	<100	<66	<356
50.	<12	<100	<66	<356
51.	<12	<100	<66	<356
52. Inlets Upstream	<12	<100	<66	<356
53.	<12	<100	<66	<356
54.	<12	<100	<66	<356
55.				
56.				
57.				
58.				
59.				
60.				
61.				
62.				
63.				
64.				
65.				
66.				
67.				
68.				
69.				
70.				

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Total Alpha	Total Beta
71.				
72.				
73.				
74.				
75.				
76.				
77.				
78.				
79.				
80.				
81.				
82.				
83.				
84.				
85. N/A				
86.				
87.				
88.				
89.				
90.				
91.				
92.				
93.				
94.				
95.				
96.				
97.				
98.				
99.				
100.				
101.				
102.				

Date Reviewed: 12/21/99 RS Supervision: K. Graham [redacted]

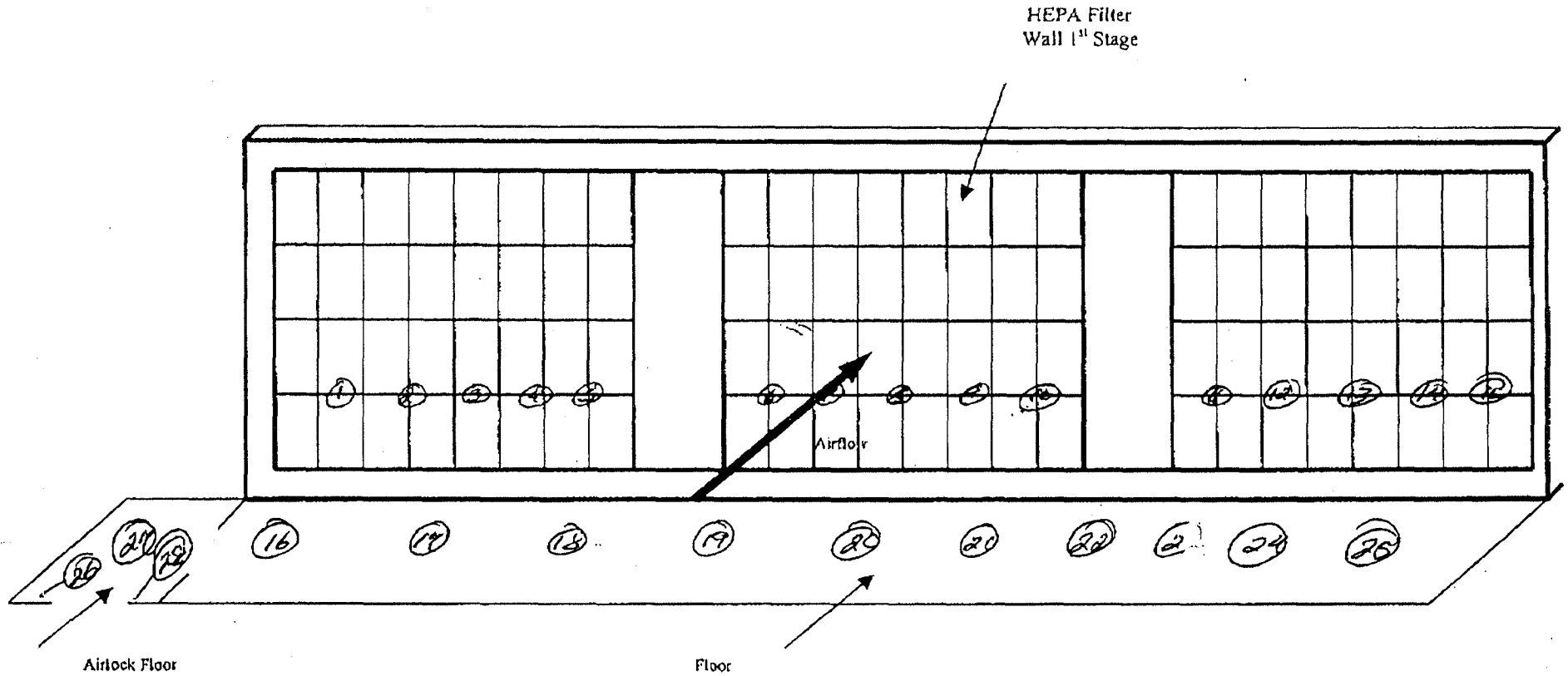
Print Name Signature

183

Building 991

Beryllium Smear Locations

Filter Plenum 991

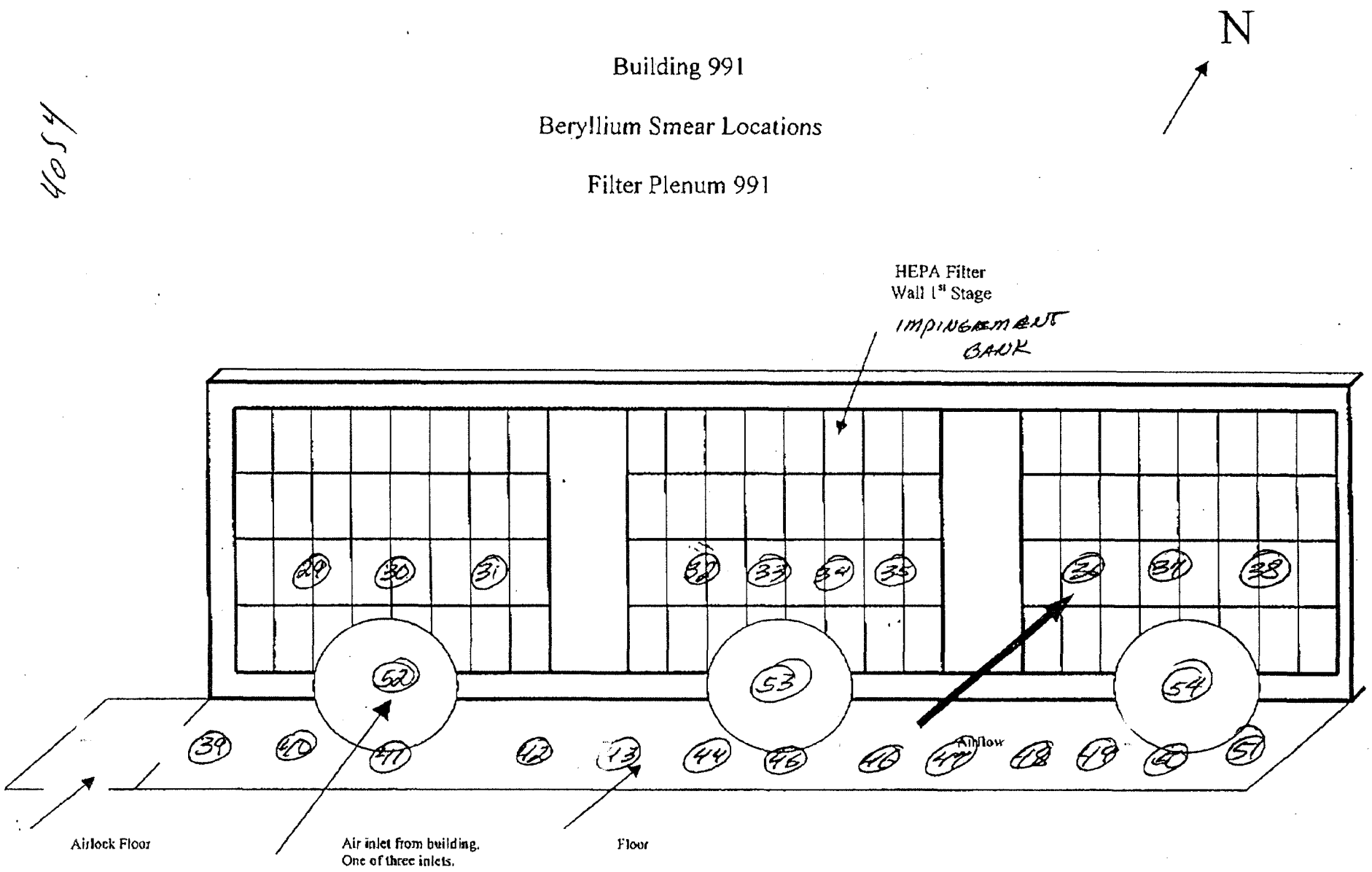


Up stream side of filter bank. Filters in backs of 32 (4x8) with 3 banks, approx. 8' spaces in between each bank. Drawing not to scale.

Building 991

Beryllium Smear Locations

Filter Plenum 991



Up stream side of filter bank. Filters in blocks of 32 (4x8) with 3 banks, approx. 8' spaces in between each bank. Drawing not to scale.

ORIGINAL 1 of 2

RS FORMS 07.01-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. eberline	Mfg. Ludlum	Mfg.
Model AO20	Model 12-4	Model
Serial # 0170	Serial # 70159	Serial #
Cal Due 3-14-00	Cal Due 3-21-00	Cal Due A
Bkg. N/A	Bkg. N/A	Bkg. N
Efficiency N/A	Efficiency N/A	Efficiency
MDA 1.0 mR/hr	MDA 1.0 mR/hr	MDA
Mfg.	Mfg.	Mfg.
Model	Model	Model
Serial #	Serial # D	Serial #
Cal Due	Cal Due N	Cal Due
Bkg.	Bkg.	Bkg.
Efficiency	Efficiency	Efficiency
MDA	MDA	MDA

Survey Type: GAMMA NEUTRON SURVEY

Building: 991 plenum

Location: upstream side

Purpose: Survey for Back Sprinklers

RWP #: 99-991-0082

Date: 12-17-99 Time: 1500

RCT: Dennis [redacted]
Print name Signature

RCT: / /
Print name Signature Emp. #

PRL # :

Comments:

SURVEY RESULTS

Description/Location	Gamma/Neutron -mrem/hr @ 30 cm Gamma	Neutron	Total	Description /Location	Gamma/Neutron -mrem/hr @ 30 cm Gamma	Neutron	Total
1. Filters Upstream	<1.0	<1.0	<2.0	23. Filters Upstream	<1.0	<1.0	<2.0
2.	<1.0	<1.0	<2.0	24.	<1.0	<1.0	<2.0
3.	<1.0	<1.0	<2.0	25.			
4.	<1.0	<1.0	<2.0	26.			
5.	<1.0	<1.0	<2.0	27.			
6.	<1.0	<1.0	<2.0	28.			
7.	<1.0	<1.0	<2.0	29.			
8.	<1.0	<1.0	<2.0	30.			
9.	<1.0	<1.0	<2.0	31.			
10.	<1.0	<1.0	<2.0	32.			
11.	<1.0	<1.0	<2.0	33.			
12.	<1.0	<1.0	<2.0	34.			
13.	<1.0	<1.0	<2.0	35.			
14.	<1.0	<1.0	<2.0	36.			
15.	<1.0	<1.0	<2.0	37.			
16.	<1.0	<1.0	<2.0	38.			
17.	<1.0	<1.0	<2.0	39.			
18.	<1.0	<1.0	<2.0	40.			
19.	<1.0	<1.0	<2.0	41.			
20.	<1.0	<1.0	<2.0	42.			
21.	<1.0	<1.0	<2.0	43.			
22.	<1.0	<1.0	<2.0	44.			

Date Reviewed: 12/21/99 RS Supervision: K. Gartland / [redacted]
Print Name Signature

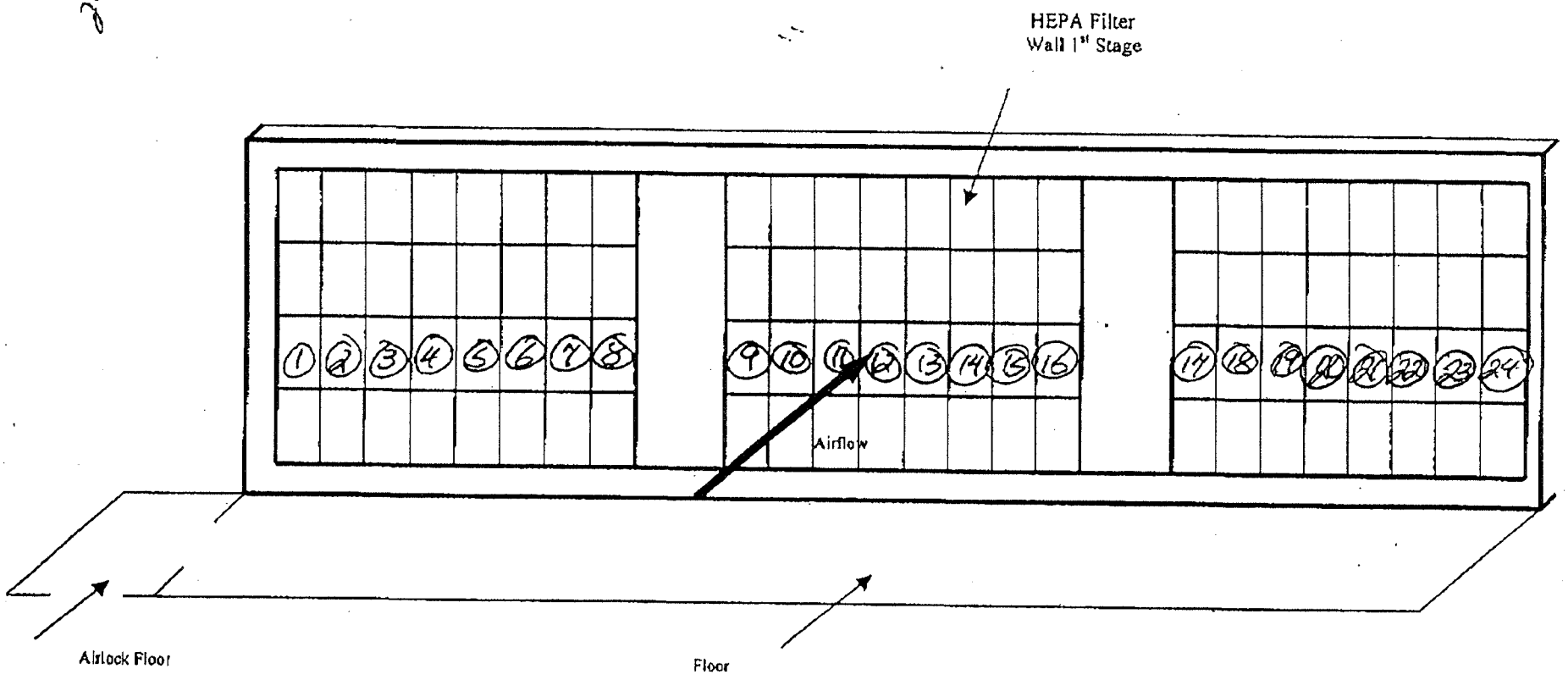
186

Building 991

Beryllium Smear Locations

Filter Plenum 991

N



Up stream side of filter bank. Filters in backs of 32 (4x8) with 3 banks, approx. 8' spaces in between each bank. Drawing not to scale.

ORIGINAL

RS FORMS 07.02-01

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. eberline	Mfg. eberline	Mfg.
Model SAC-4	Model BC-4	Model
Serial # 1052	Serial # 917	Serial #
Cal Due 2-17-00	Cal Due 6-17-00	Cal Due A
Bkg. 0.0	Bkg. 42	Bkg. N
Efficiency 33%	Efficiency 25%	Efficiency
MDA 8 dpm	MDA 100 dpm	MDA
Mfg.	Mfg.	Mfg.
Model	Model	Model
Serial #	Serial #	Serial #
Cal Due	Cal Due A	Cal Due
Bkg.	Bkg. N	Bkg.
Efficiency	Efficiency	Efficiency
MDA	MDA	MDA

Survey Type: Alpha/Beta

Building: 991

Location: 91 Plenum Downstream

Purpose: Control point

PRL# :

RWP #: 99-991-0082

Date: 12-28-99 Time: 0815

RCT: Dennis [redacted]
Print name Signature

RCT: / /
Print name Signature Emp. #

Comments:

SURVEY RESULTS

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Fixed Alpha	Fixed Beta
1. Filter Bank	<8	<100		
2.	<8	<100		
3.	<8	<100		
4.	<8	<100		
5.	<8	<100		
6.	<8	<100		
7. Floor	<8	<100		
8.	<8	<100		
9.	<8	<100		
10.	<8	<100		
11.	<8	<100		
12.	<8	<100		
13. Filter B16	<8	<100		
14. Airlock	<8	<100		
15.	<8	<100		
16.	<8	<100		
17.	<8	<100		
18.				
19				

Description/Location Results in DPM/100cm²	Removable Alpha	Removable Beta	Fixed Alpha	Fixed Beta
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				
37.				
38.				

Date Reviewed: 10/28/99 RS Supervision: D. Frenette
Print Name Signature / [redacted]

188

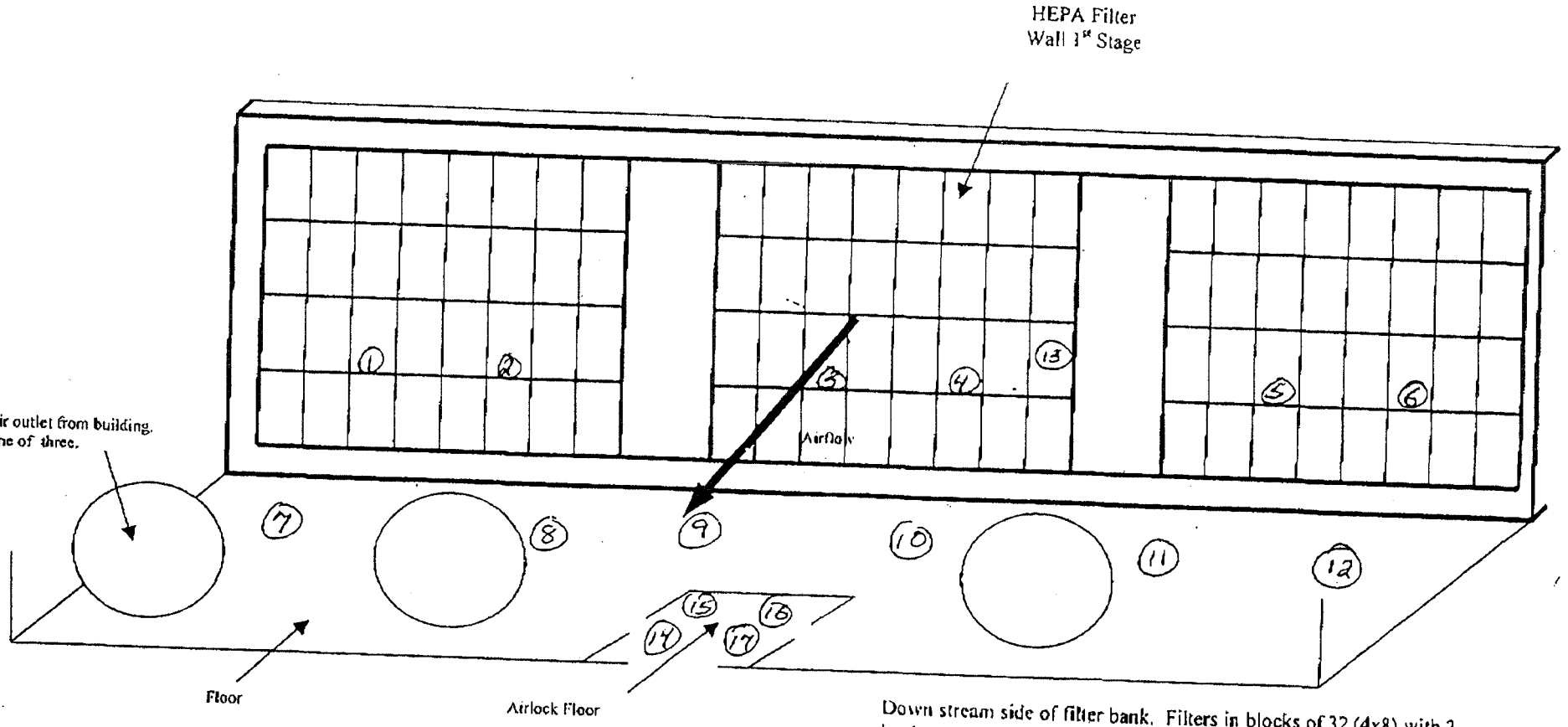
N

Building 991

Beryllium Smear Locations

Filter Plenum 991

Outlet Side



Down stream side of filter bank. Filters in blocks of 32 (4x8) with 3 banks, approx. 8' spaces in between each bank. Drawing not to scale.

ORIGINAL

RS FORMS 04.02-04

Standard Air Sample Analysis Form

High-Volume Air Samples

Bldg #: ~~707~~ 991 Purpose: Plenum Entry / Survey RWP #: 99-991-0082

Isotope: Pu^{239} Inhalation Class: W Filter Media: 47mm PLANCHET

Sample ID #	2
Location	991 Plenum 4.3
Sampler Model / Serial #	Staplex / 16479N
Sampler Calibration Due Date	~~12-17-99~~ 12-17-99
Date / Time On	12-17-99 ~~1130~~ 1130
Date / Time Off	12-17-99 1140
Total Run Time (min)	10
Average Flow Rate (cfm)	45
m3/min = (cfm x 0.0283)	1.2735
Volume V=m3/min x time	12.735

COUNT ANALYSIS DATA:		RECOUNT #1	RECOUNT #2
Date	12-17-99	12-27-99	
Time	1145	1235	
Instrument Model / Serial #	SAC 4 / 1841	SAC-4 / 1052	
Instrument Calibration Due Date	1-13-00	2-17-00	
Total Count	82	9	
Count Duration (min)	10	10	
Gross Count Rate (cpm)	8.2	0.9	
Background Count Rate (cpm)	0.1	0.3	
Net Count Rate (cpm)	8.1	0.6	
Net Activity (C1) in dpm	24.3	1.8	

SAC-4 (dpm = cpm x 3) Electra (dpm = cpm x 6) Ludlum 12-1A (dpm = cpm x 2)

CF = 0.7 4-in filter

CF = 0.2 47-mm punchout

CF = 0.5 planchet

$$DAC = \frac{C1}{(V)(CF)(DAC_{Ref})} \qquad \frac{(12.735)(0.5)(4.4)}{24.3} \qquad 28{,}017$$

DAC_{Ref}	4.8	4.8	4.8
Correction Factor (CF)	0.5	0.5	0.5
Calculated DAC:	0.867	0.0642	
RCT Printed Name	L.R. HARDIN	D. FRENETTE	
RCT Signature	[redacted]		

Approved by: RS Supervision D. Frenette [redacted] 12/28/99

Print Name Signature Date

Rev. 02/00

190

ORIGINAL

RS FORMS 04.02-04

Standard Air Sample Analysis Form

High-Volume Air Samples

Bldg #: ~~707~~ 991 12-17-99 Purpose: Plenum Entry / Survey RWP #: 99-991-0082

Isotope: Pu239 Inhalation Class: W Filter Media: 47mm PLANCHET

Sample ID #	1
Location	991 Plenum ~~ISA~~ AIRLOCK
Sampler Model / Serial #	Staplex / 18479 N
Sampler Calibration Due Date	
Date / Time On	12-17-99
Date / Time Off	12-17-99
Total Run Time (min)	10
Average Flow Rate (cfm)	45
m3/min = (cfm x 0.0283)	1.2735
Volume V=m3/min x time	12.735

COUNT ANALYSIS DATA:		RECOUNT #1	RECOUNT #2
Date	12-17-99		
Time	~~SAC 4~~ 1103		
Instrument Model / Serial #	SAC 4 / 841		
Instrument Calibration Due Date	1-13-00		
Total Count	41		
Count Duration (min)	10		
Gross Count Rate (cpm)	4.1		
Background Count Rate (cpm)	0.1		
Net Count Rate (cpm)	4.0		
Net Activity (C1) in dpm	12.0		

SAC-4 (dpm = cpm x 3) Electra (dpm = cpm x 6) Ludlum 12-1A (dpm = cpm x 2)

CF = 0.7 4-in filter

CF = 0.2 47-mm punchout

CF = 0.5 planchet

$$DAC = \frac{C1}{(V)(CF)(DAC_{Ref})} \quad \frac{12}{(12.735)(0.5)(4.8)} = \frac{12}{28.017}$$

DAC_{Ref}	4.8	4.8	4.8
Correction Factor (CF)	0.5	0.5	0.5
Calculated DAC:	0.428		
RCT Printed Name	LR HARRISON		
RCT Signature	[signature]		

[redacted]

Approved by: RS Supervision D. Franette [signature] [redacted] 12/27/99

Print Name Signature Date

Rev. 07/99

191

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg.	Eberline	Mfg.	Eberline	Mfg.	Eberline
Model	SAC-4	Model	SAC-4	Model	SAC-4
Serial #	824	Serial #	851	Serial #	963
Cal Due	10/1/02	Cal Due	10/29/02	Cal Due	1/3/03
Bkg.	0.1 dpm α	Bkg.	0.1 dpm α	Bkg.	0.1 dpm α
Efficiency	33.3 %	Efficiency	33.3 %	Efficiency	33.3 %
MDA	20 dpm α	MDA	20 dpm α	MDA	20 dpm α
Mfg.	Eberline	Mfg.	Eberline	Mfg.	Eberline
Model	BC-4	Model	BC-4	Model	BC-4
Serial #	704	Serial #	835	Serial #	700
Cal Due	10/30/02	Cal Due	7/16/03	Cal Due	12/13/02
Bkg.	33.9 dpm β	Bkg.	32.1 dpm β	Bkg.	32.3 dpm β
Efficiency	25 %	Efficiency	25 %	Efficiency	25 %
MDA	200 dpm β	MDA	200 dpm β	MDA	200 dpm β

Survey type: Contamination
Building: 991
Location: 991
Purpose: Shipment of Beryllium Samples
RWP #: 02-991-008
Date: 8/27/02 **Time:** 13:30
RCT: A. Conley (Print name) (Signature) [redacted]
RCT: J. Absher (Print name) (Signature)

PRN/REN # :
Comments: Sample number 999-07232002-315-135 determined to be below release limits. See attached Oasis report for alpha analysis.

SURVEY RESULTS

Beryllium Swipes rev 9/16/02

Swipe #	LOCATION/DESCRIPTION	ALPHA Swipe dpm/100cm2	ALPHA Direct dpm/100cm2	ALPHA Wipe dpm/wipe	BETA Swipe dpm/100cm2	BETA Direct dpm/100cm2	BETA Wipe dpm/wipe
1	991Tun-08232002-315-136 to 137	<20	NA	NA	<200	NA	NA
2	991Tun-07242002-315-101 to 137	<20			<200		
3	996-07242002-101-117	<20			<200		
4	997-07232002-315-101 to 117	<20			<200		
5	998-07252002-315-101 to 124	<20			<200		
6	999-07232002-315-118 to 134	<20			<200		
7	999-07232002-315-135 (see comments)	36			<200		
8	999-07232002-315-136 to 137	<20			<200		
9	997-08202002-315-125 to 126	<20			<200		
10	991Tun-08202002-315-127	<20			<200		
11	998-08212002-315-128 to 130	<20			<200		
12	991Tun-08222002-315-131 to 132	<20			<200		
13	999-08222002-315-133	<20			<200		
14	996-08232002-315-134 to 135	<20			<200		
15	NA	NA			NA		
16							
17							
18							
19							
20	NA	NA	NA	NA	NA	NA	NA

Date Reviewed: 8-28-02 **RS Supervision:** Teresa Thaxton (Print Name) (Signature) [redacted]

192

****
***** RFETS B771 ALPHA SPECTROMETER ANALYSIS RESULTS *****
****

Sample ID: 082602c Type: 999-07232002-315-135

Batch Id: $020826
Acquisition Start: 8/26/02 5:02:29 PM
Analysis Date: 8/27/2002 5:02:57 AM
Detector Name: A_1_1A
Spectrum File: d:\aanalyst\SELBIFS\$020826\52.CNF
Acquisition Live Time: 43200.0 seconds
Calibrations:
Energy = 2.372 MeV + 1.6182E-003*ch
FWHM = 5.8901E-002 MeV
Low Tail = 1.7770E-002 MeV
Filter Correction Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2563 +/- 0.0095 on 7/25/02 8:05:01 AM
Effective Efficiency: 0.2563 +/- 0.0095
Sample Size: 1.000 swipe

----- ROI DATA -----

Peak No.	Associated Nuclide	ROI Start - End	Energy (keV)	FWHM (keV)
1	PO-210	79- 1840	4380.295	10.586
2	Bi-212	1967- 2305	5815.120	1.618
3	PO-214	2605- 3402	7232.365	1.618
4	PO-212	3721- 3941	8563.479	1.618

----- ROI ANALYSIS RESULTS -----

Nuclide	Net Counts +/- %1s	BKG counts	CPM
PO-210	5004.000 +/- 1.422	29.000	6.950
Bi-212	5.000 +/- 60.000	2.000	0.007
PO-214	4.000 +/- 61.237	1.000	0.006
PO-212	1.000 +/-100.000	0.000	0.001

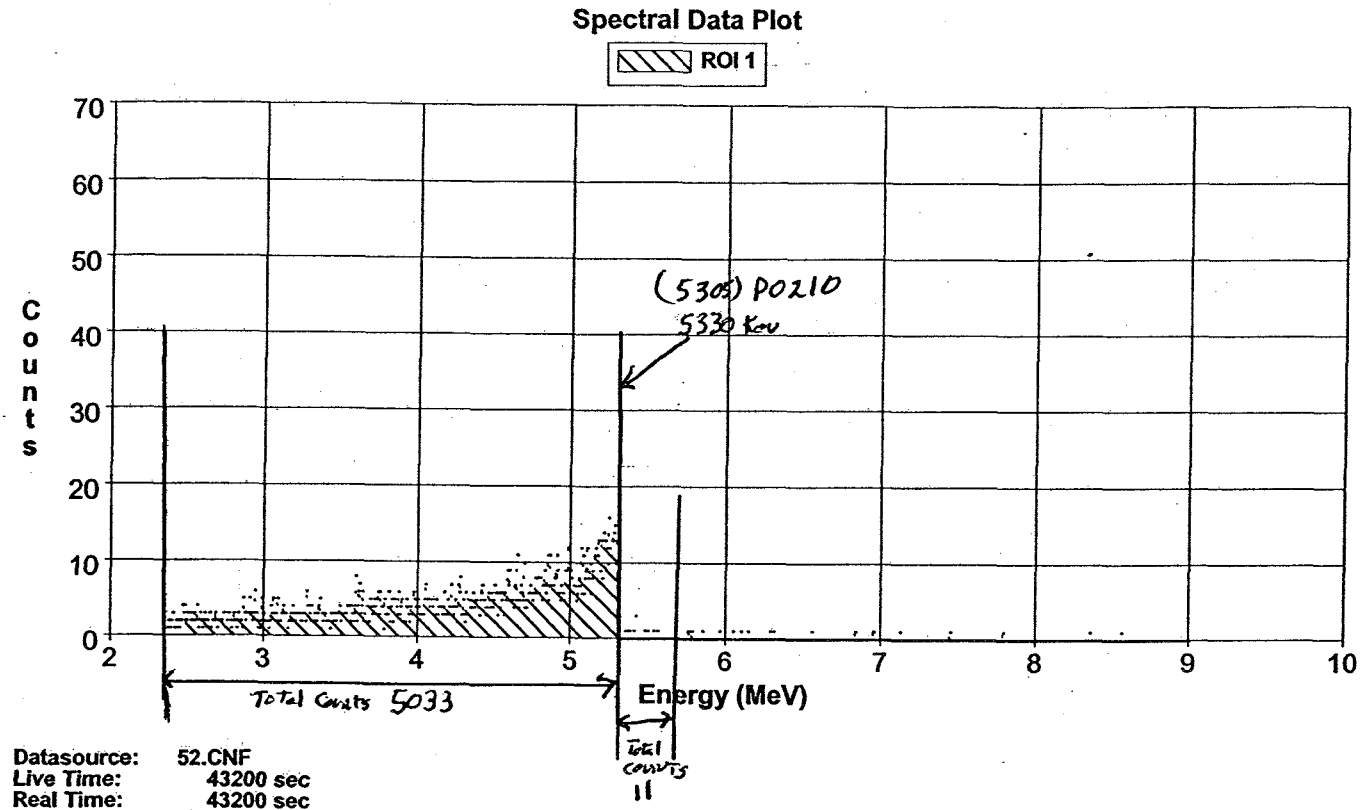
----- NUCLIDE ANALYSIS RESULTS -----

Nuclide Name	Id Conf.	ROI Midpt (keV)	Activity +/- 2s dpm/swipe	MDA dpm/swipe
PO-210	0.992	3926.00*	2.715E+001 +/- 2.164E+000	1.506E-001
Bi-212	1.000	5830.00*	7.524E-002 +/- 9.046E-002	1.398E-001
PO-212	1.000	8572.00*	5.419E-003 +/- 1.085E-002	1.468E-002
PO-214	1.000	7234.00*	2.168E-002 +/- 2.660E-002	3.990E-002

Analysis Reviewed by: G. A Haas [stamp: G.A. HAAS 515855]

Approved by: M Kovach Michelle L. Kovach 518111

193



Datasource: 52.CNF
Live Time: 43200 sec
Real Time: 43200 sec
Acq. Start: 8/26/02 5:02:29 PM
Start: 1 : 2.37 (MeV)
Stop: 4096 : 9.00 (MeV)

****
***** RFETS B771 ALPHA SPECTROMETER ANALYSIS RESULTS *****
****

Sample ID: 082602c Type: 999-07232002-315-135

Batch Id: $020826
Acquisition Start: 8/26/02 3:52:09 PM
Analysis Date: 8/26/2002 4:22:59 PM
Detector Name: A_1_1A
Spectrum File: d:\aanalyst\SELBIFS\$020826\48.CNF
Acquisition Live Time: 1800.0 seconds
Calibrations:
Energy = 2.372 MeV + 1.6182E-003*ch
FWHM = 5.8901E-002 MeV
Low Tail = 1.7770E-002 MeV
Filter Correction Factor: 1.0000 +/- 0.0000
Counting Efficiency: 0.2563 +/- 0.0095 on 7/25/02 8:05:01 AM
Effective Efficiency: 0.2563 +/- 0.0095
Sample Size: 1.000 swipe

----- ROI DATA -----

Peak No.	Associated Nuclide	ROI Start	ROI End	Energy (keV)	FWHM (keV)
1	Pu+Am	68	1921	4272.760	2.023
2	Bi-212	1956	2294	5810.958	0.000
3	PO-214	2594	3390	7403.245	1.618
4	PO-212	3709	3929	8552.151	0.000

----- ROI ANALYSIS RESULTS -----

Nuclide	Net Counts +/- %1s	BKG counts	CPM
Pu+Am	226.792 +/- 6.659	1.208	7.560
Bi-212	-0.083 +/- 70.711	0.083	-0.003
PO-214	0.958 +/-104.438	0.042	0.032
PO-212	0.000 +/-1000.00	0.000	0.000

----- NUCLIDE ANALYSIS RESULTS -----

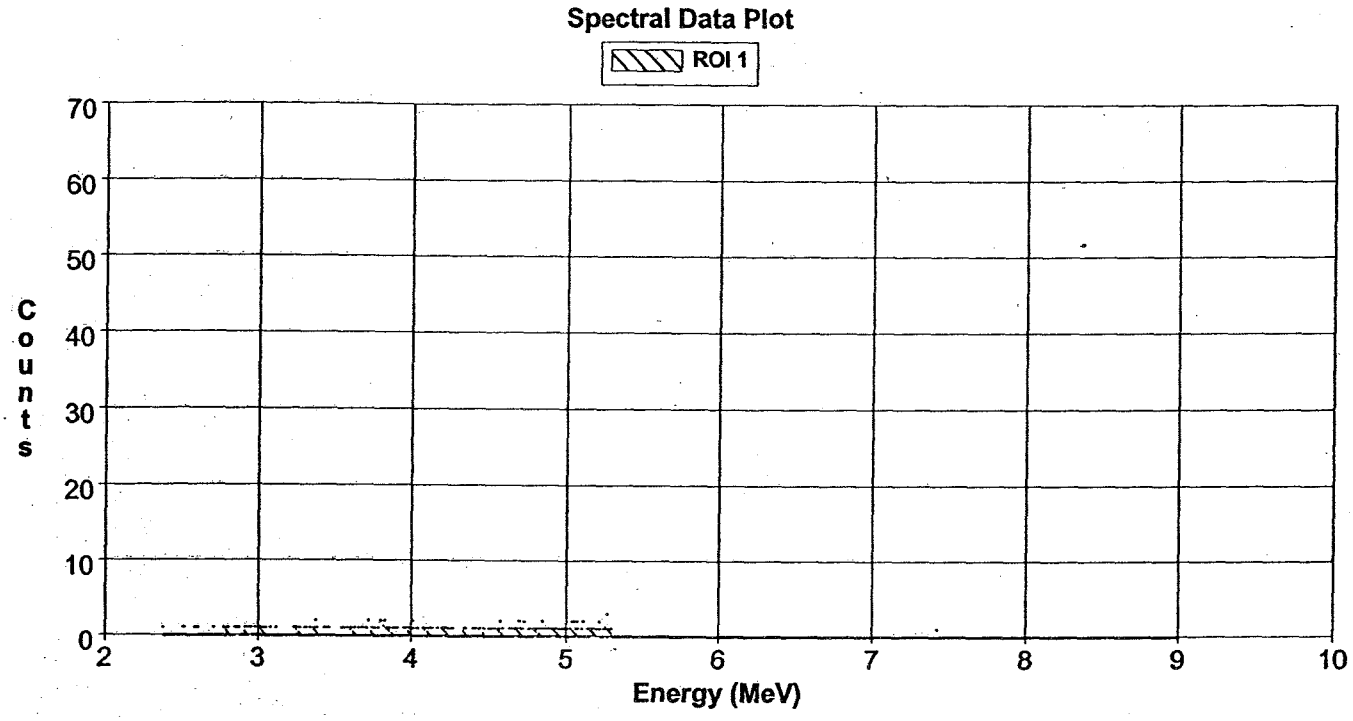
Nuclide Name	Id Conf.	ROI Midpt (keV)	Activity +/- 2s dpm/swipe	MDA dpm/swipe
~~Pu+Am~~	~~0.997~~	~~4000.00*~~	~~2.949E+001 +/- 4.500E+000~~	~~8.325E-001~~
Bi-212	1.000	5830.00*	-3.010E-002 +/- 4.262E-002	1.329E+000
PO-212	1.000	8572.00*	0.000E+000 +/- 9.683E-003	3.524E-001
PO-214	0.999	7234.00*	1.246E-001 +/- 2.605E-001	4.416E-001

SEE SPECTRUM MKB 8-27-02

Analysis Reviewed by: C. Hepp 511253

Approved by: Michelle A. Konrach 518111

195



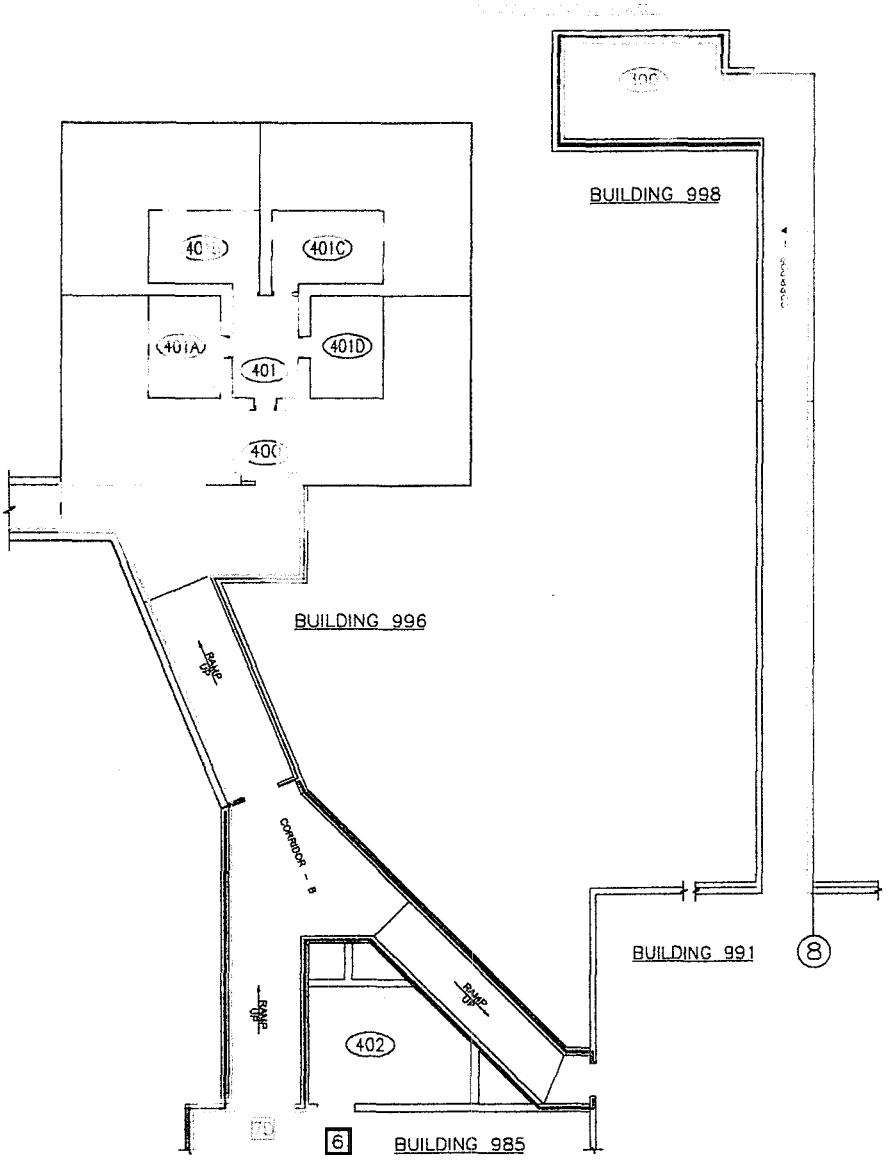
Datasource:	48.CNF
Live Time:	1800 sec
Real Time:	1800 sec
Acq. Start:	8/26/02 3:52:09 PM
Start:	1 : 2.37 (MeV)
Stop:	4096 : 9.00 (MeV)

ATTACHMENT C-10

Inaccessible Floor Area Survey Maps

PRE-DEMOLITION SURVEY FOR BUILDING 991

Survey Area: N/A **Survey Unit: N/A** **Classification: 3**
Building: 991 - Type 2
Survey Unit Description: Inaccessible Storage Areas
Total Area: N/A sq. m. **Total Floor Area: N/A sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit
- Inaccessible Drum Storage Areas

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s):

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 DynCorp THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/991-INACC-1 Sept. 16, 2002

198

ATTACHMENT D

Chemical Data Summaries and Sample Maps

ATTACHMENT D-1

Asbestos Data

Chemical Data Summaries and Sample Maps

Asbestos Data Summary

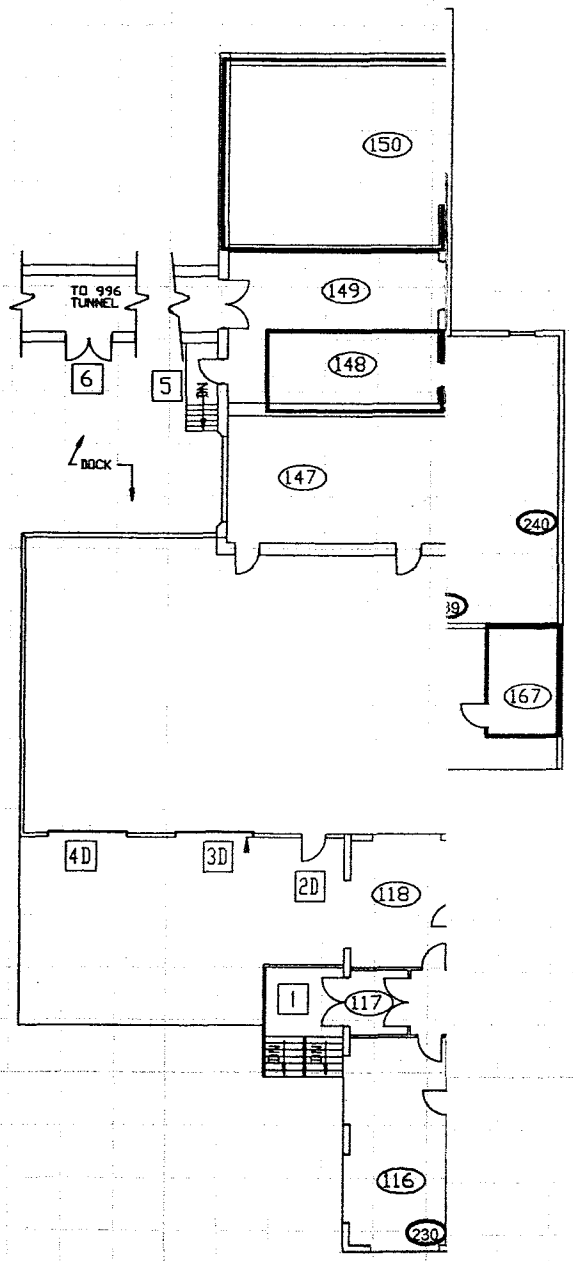
Sample Number	Survey Map Location Point	Material Sampled & Location	Analytical Results
Building 991			
991-07102002-315-201	201	Room 101 – White and green paint on CMU, west wall	None Detected
991-07102002-315-202	202	Room 101 – White aircell TSI in SW corner on elbow < 6" OD	65% Chrysotile
991-07102002-315-203	203	Room 101 – White window caulking, east window at south wall	None Detected
991-07102002-315-204	204	Room 101 – White TSI on elbow at ceiling mounted AC unit, west wall	12% Chrysotile; 2%Trem-Act
991-07102002-315-205	205	Room 101 – White & green paint on CMU, west wall	None Detected
991-07102002-315-206	206	Room 101 – White & green paint on CMU, west wall	*Trace* Chrysotile; 0.5% *Point Count*
991-07102002-315-207	207	Room 101 – White TSI on elbow at ceiling mounted AC unit, west wall	15 % Chrysotile
991-07102002-315-208	208	Room 101 – White TSI on elbow at ceiling mounted AC unit, west wall	15% Chrysotile
991-07102002-315-209	209	Room 124 – 12" white & green vinyl floor tile and dark mastic	7% Chrysotile
991-07102002-315-210	210	Room 124 – 9" white, beige, & tan vinyl floor tile and black mastic	12% Chrysotile
991-07102002-315-211	211	Room 126 – 1' x 4' solid white drop ceiling tile	None Detected
991-07102002-315-212	212	Room 126 – 2' x 4' white with small flecked surface, drop ceiling tile	None Detected
991-07102002-315-213	213	Room 126 – 2' x 4' white "worm" drop ceiling tile	None Detected
991-07102002-315-214	214	Room 126 – 2' x 4' white "worm " and flecked drop ceiling tile	None Detected
991-07102002-315-215	215	Room 126 – 12" white and green vinyl floor tile with black mastic	7% Chrysotile
991-07102002-315-216	216	Room 124 – 9 " white, beige, tan vinyl floor tile with black mastic	12% Chrysotile
991-07102002-315-217	217	Room 124 – 12" white & turquoise vinyl floor tile with tan mastic	None Detected
991-07102002-315-218	218	Room 124 – Transite (white exterior, green interior) wall panel, south wall	28% Chrysotile
991-07102002-315-219	219	Room 124 – White TSI elbow at ceiling mounted AC unit, north wall	14% Chrysotile, 1% Crocidolite
991-07102002-315-220	220	Room 114 – White TSI elbow at ceiling SE corner, <6" OD	3% Chrysotile, 12% Amosite
991-07102002-315-221	221	Room 114 – Green TSI elbow at ceiling mounted AC unit, south wall	8% Chrysotile, 2% Crocidolite
991-07102002-315-222	222	Room 114 – White TSI elbow at radiator unit, SE corner < 6" OD	8% Chrysotile, 20% Amosite
991-07102002-315-223	223	Room 122A – White TSI elbow at ceiling mount AC unit, north wall	15% Chrysotile
991-07102002-315-224	224	Room 122A – Dark brown cove base and tan adhesive	None Detected
991-07102002-315-225	225	Room 122A – Drywall only, west wall	1.5% Chrysotile, Point Count
991-07102002-315-226	226	Room 122 – Beige TSI elbow at radiator, NW corner <6" OD	7% Chrysotile, 15% Amosite
991-07102002-315-227	227	Room 122 – Beige TSI aircell pipe insulation, NW corner <6" OD	60% Chrysotile
991-07102002-315-228	228	Room 113 – White TSI aircell elbow at radiator, SE corner <6" OD	60% Chrysotile
991-07102002-315-229	229	Room 115 – White TSI elbow, NE corner <6" OD	60% Chrysotile
991-07102002-315-230	230	Room 116 – White TSI aircell elbow at radiator, SE corner <6" OD	85% Chrysotile
991-07112002-315-231	231	Room 2 – Green TSI aircell on domestic hot water pipe run, north utility tunnel <6" OD	65% Chrysotile
991-07112002-315-232	232	Room 2 – Green wrap over fiberglass on DHW pipe run, north utility tunnel <6" OD	None Detected
991-07112002-315-233	233	Room 2 – Green wrap over fiberglass on "heating water" pipe, north utility tunnel, <6" OD	None Detected
991-07112002-315-234	234	Room 2 – Green wrap over fiberglass on DHW re-circulate, north utility tunnel, <6" OD	None Detected
991-07112002-315-235	235	Room 2 – Fiberglass pipe run (Cooling Water Supply) with green wrap,	None Detected

Sample Number	Survey Map Location Point	Material Sampled & Location	Analytical Results
		north utility tunnel, < 6" OD	
991-07112002-315-236	236	Room 2 – Fiberglass pipe run (Domestic Hot Water) with green wrap, north utility tunnel, < 6" OD	None Detected
991-07112002-315-237	237	Room 2 – Fiberglass pipe run (Domestic Hot Water) with green wrap, north utility tunnel, < 6" OD	None Detected
991-07112002-315-238	238	Room 2 – Fiberglass pipe run (Cooling Water Supply) with green wrap, north utility tunnel, < 6" OD	None Detected
991-07112002-315-239	239	Room 166 – White paint on couth CMU wall	None Detected
991-07112002-315-240	240	Room 166 – White paint on east CMU wall	None Detected
991-07112002-315-241	241	Room 131B – 12" gray & white floor tile with mastic	7% Chrysotile
991-07112002-315-242	242	Room 156 – 12" white & tan floor tile with mastic	None Detected
991-07112002-315-243	243	Room 156 – White paint on CMU wall, entry to Room 138	None Detected
991-07112002-315-244	244	Room 164 – White TSI elbow at ceiling heater, <6" OD	Trace of Amosite, <0.25 Point Count
991-07112002-315-245	245	Room 164 – 12" white & tan floor tile and mastic	None Detected
991-07112002-315-246	246	Room 165 – White TSI elbow in NW corner of hall ceiling, <6" OD	Trace of Chrysotile, <0.25 Point Count
991-07112002-315-247	247	Room 165 – 12" white & tan floor tile with black mastic	None Detected
991-07112002-315-248	248	Room 163 – Exterior of south CMU wall at entrance, beige paint	None Detected
991-07112002-315-249	249	Room 160 – Dark brown base cove with mastic	None Detected
991-07112002-315-250	250	Room 161 – Beige paint on east CMU wall	None Detected
997-07232002-315-251	251	Room 601B – Beige and green peeled paint debris on floor	None Detected
991-07262002-315-252	252	B998, East corridor – Green fiberboard TSI on HVAC duct	None Detected
991-07262002-315-253	253	B998, East corridor – Green fiberboard TSI on HVAC duct	None Detected
991-07262002-315-254	254	B998, East corridor – Green fiberboard TSI on HVAC duct	None Detected
991-07262002-315-255	255	Room 160 – 12" gray & white floor tile with black mastic	7% Chrysotile
991-07262002-315-256	256	Room 131B – 12" gray & white floor tile with tan mastic	7% Chrysotile
991-07262002-315-257	257	Room 153 – 12" gray & white floor tile with tan & black mastic	7% Chrysotile
991-07262002-315-258	258	Room 153 – 12" gray & white floor tile with tan & black mastic	7% Chrysotile
991-07262002-315-259	259	Room 153 – 12" gray & white floor tile with tan & black mastic	7% Chrysotile
991-07262002-315-260	260	Room 153 – 2" x 4" white acoustical drop ceiling tiles with "worm" pattern	None Detected
991-07262002-315-261	261	Room 153 – 2" x 4" white acoustical drop ceiling tiles with "worm" pattern	None Detected
991-07262002-315-262	262	Room 153 – 2" x 4" white acoustical drop ceiling tiles with "worm" pattern	None Detected
991-07262002-315-263	263	Room 140A – Drywall only	Trace of Chrysotile, <0.25 Point Count
991-07262002-315-264	264	Room 140A – Drywall and joint compound	None Detected
991-07262002-315-265	265	Room 146 – 2' x 4' gray & white drop ceiling tile	None Detected
991-07262002-315-266	266	Room 146 – 12" beige and tan floor tile and mastic	None Detected
991-07262002-315-267	267	Room 146 – Brown vinyl base cove and tan mastic	None Detected
991-07262002-315-268	268	Room 141 – Drywall only	None Detected
991-07262002-315-269	269	Room 141 – Joint compound only	2% Chrysotile, 0.75 Point Count

Sample Number	Survey Map Location Point	Material Sampled & Location	Analytical Results
991-07262002-315-270	270	Room 141 – White TSI elbow "Heating Water Return", >6" OD	None Detected
991-07262002-315-271	271	Room 141 – White pipe caulking	None Detected
991-07262002-315-272	272	Room 141 – Green TSI pipe run "Heating Water Return", >6" OD	None Detected
991-07262002-315-273	273	Room 141 – Green TSI pipe fitting "Heating Water Return", >6" OD	2% Amosite, 1.25 Point Count
991-07262002-315-274	274	Room 141 – 12" white on tan floor tile and black mastic	7% Chrysotile
991-07262002-315-275	275	Room 141 – 12" tan on tan floor tile with brown mastic	None Detected
991-07262002-315-276	276	Room 142 – White TSI pipe run, <6" OD	17% Amosite, 8% Chrysotile
991-07262002-315-277	277	Room 170 – Drywall only	None Detected
991-07262002-315-278	278	Room 170 – Drywall and joint compound	None Detected
991-07262002-315-279	279	Room 170 – Roofing tar with silver paint	3% Chrysotile, 1.5 Point Count
991-07262002-315-280	280	Room 170 – Roofing flashing	25% Chrysotile (Tar), 3% Chrysotile (Silver Paint)
991-07262002-315-281	281	Room 136 – White paint on CMU, west wall	None Detected
991-07262002-315-282	282	Room 136 – White paint on CMU, west wall	None Detected
991-07262002-315-283	283	Room 134 – White paint on CMU, west wall	None Detected
991-07262002-315-284	284	Room 134 – White paint on CMU, east wall	None Detected
991-07262002-315-285	285	Room 131B – Beige paint on CMU, west wall	None Detected
991-07262002-315-286	286	Room 131B – White and green paint on CMU, east wall	Trace of Chrysotile, <0.25 Point Count
991-07262002-315-287	287	Room 131B – White and green paint on CMU, east entry to Room 160	Trace of Chrysotile, <0.25 Point Count
991-07262002-315-288	288	Room 134 – HVAC duct, white wrap over fiberglass above Room 136	None Detected
991-07262002-315-289	289	Room 134 – White, hard TSI fitting above Room 136, <6" OD	8% Chrysotile, 17% Amosite
991-07262002-315-290	290	Room 134 – White, hard TSI fitting above Room 136, < 6" OD	2% Amosite, 1% Point Count
991-08122002-315-291	291	Roof – Black tar with silver paint at base of air unit	3% Chrysotile, 1.75 Point Count (Silver Paint)
991-08122002-315-292	292	Roof – Black tar with silver paint at base of vent	Trace Chrysotile, 0.25 Point Count
991-08122002-315-293	293	Roof – Black tar with silver paint on side of air unit	Trace Chrysotile, 0.50 Point Count
Building 985			
985-08122002-315-294	294	White paint on CMU, south wall	Trace Chrysotile

CHEMICAL SAMPLE MAP FOR S

Building: 991 Ground F



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O SCALE

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Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for:
KAISER HILL

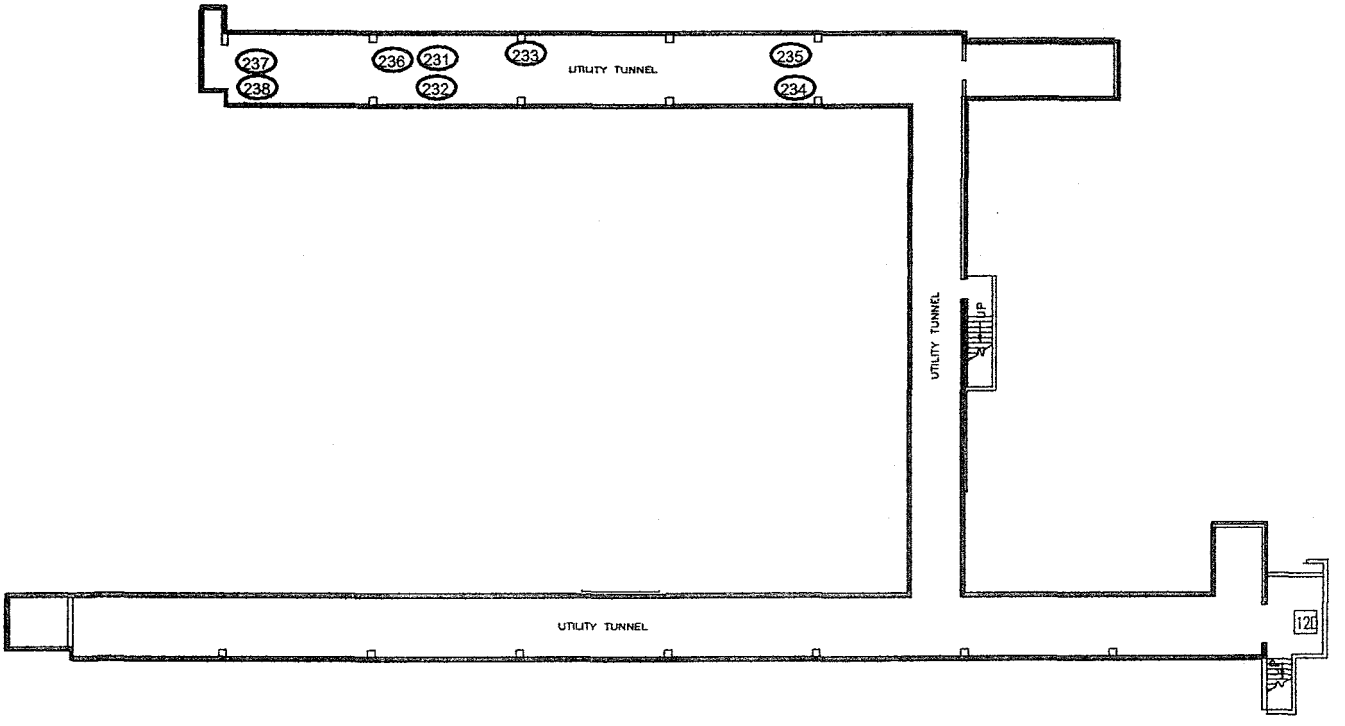
MAP ID: 02-0335/991-GRND-ASB

September 4, 2002

205

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Basement



BLDG 991 BASEMENT FLOOR PLAN

SURVEY MAP LEGEND

- (#) Asbestos Sample Location
- (#) Beryllium Sample Location
- [#] Lead Sample Location
- ◇ (#) RCRA/CERCLA Sample Location
- (#) PCB Sample Location
- ■ Open/Inaccessible Area
- □ Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

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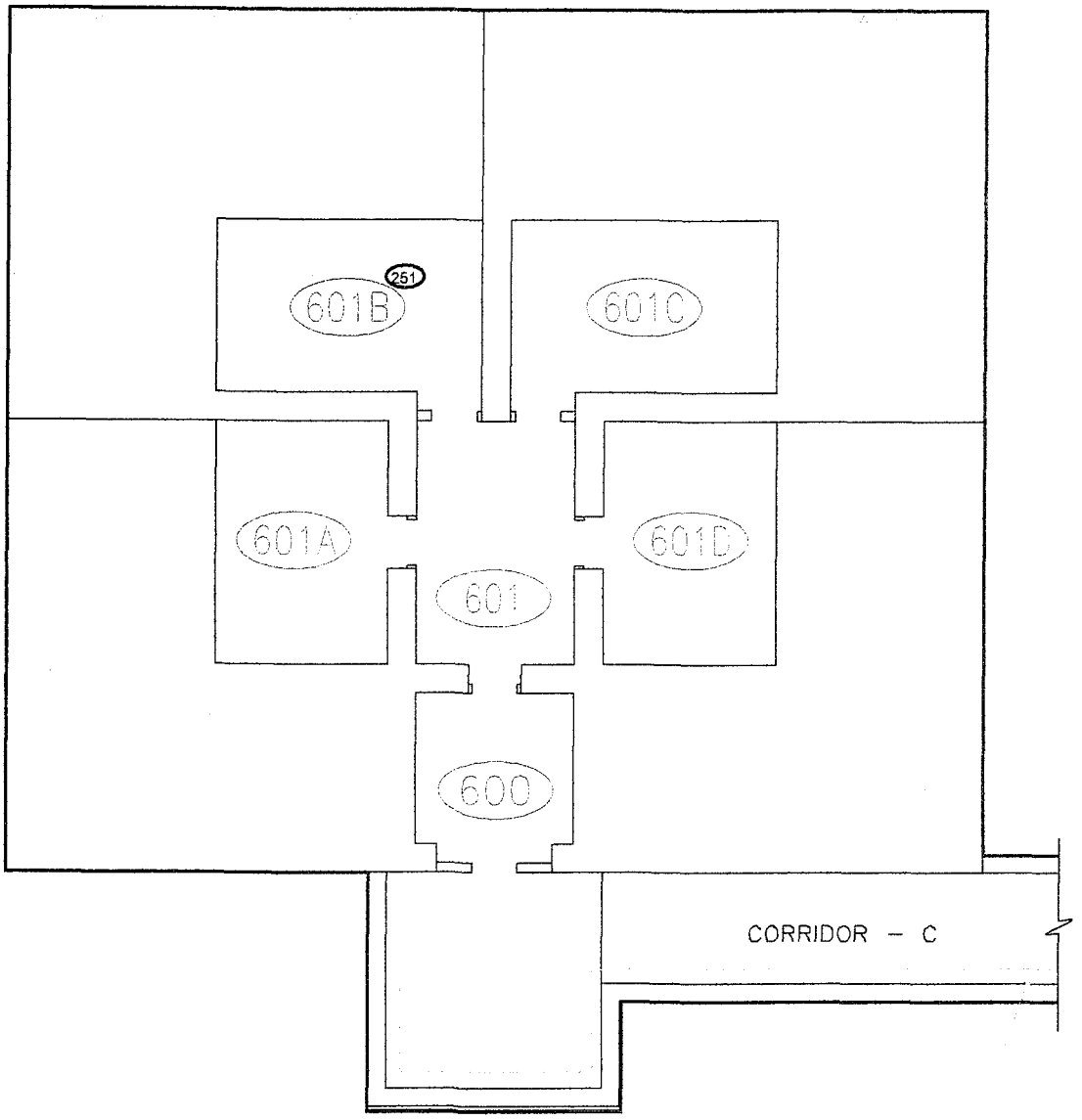
MAP ID: 02-0355/991-BASE-ASB

September 4, 2002

206

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 997



BUILDING 997

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

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Rocky Flats Environmental Technology Site

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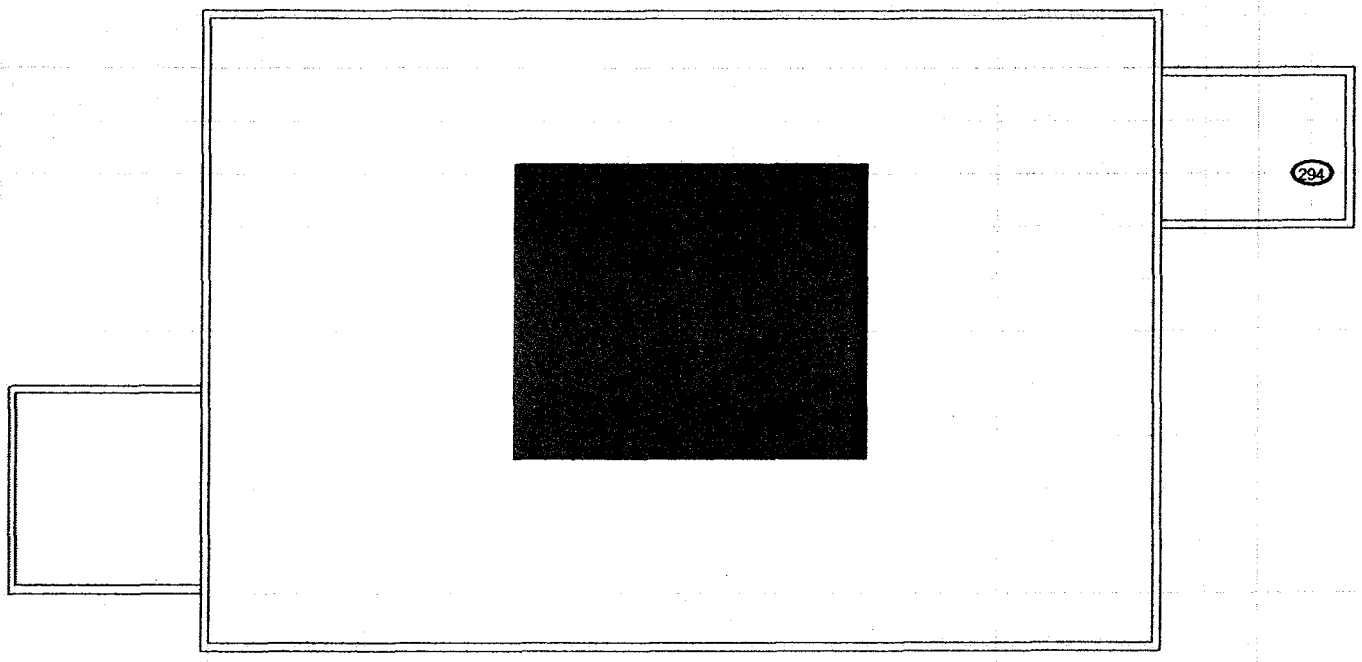
MAP ID: 02-0355/997-ASB September 4, 2002

207

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 985

B985



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15

0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
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MAP ID: 02-0355/985-BE-2 September 4, 2002

210

ATTACHMENT D-2

Beryllium Data

Chemical Data Summaries and Sample Maps

Beryllium Data Summary

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($\mu g/100\ cm^2$)
Building 997				
997-07232002-315-101	B997 -- 101	601B	Concrete floor, east	< 0.1
997-07232002-315-102	102	601C	Concrete floor, north	< 0.1
997-07232002-315-103	103	601	Concrete floor, south	< 0.1
997-07232002-315-104	104	601B	Concrete floor, west	< 0.1
997-07232002-315-105	105	601D	Concrete floor, west	< 0.1
997-07232002-315-106	106	601A	Concrete floor, middle	< 0.1
997-07232002-315-107	107	601A	Concrete floor, west	< 0.1
997-07232002-315-108	108	601C	Concrete floor, middle	< 0.1
997-07232002-315-109	109	601	Concrete floor, NE corner	< 0.1
997-07232002-315-110	110	600	Concrete floor, west	< 0.1
997-07232002-315-111	111	601B	Concrete floor, north	< 0.1
997-07232002-315-112	112	601D	Concrete floor, middle	< 0.1
997-07232002-315-113	113	601	Top of HVAC metal ductwork, horizontal surface	< 0.1
997-07232002-315-114	114	601A	Top of light fixture, NW corner	< 0.1
997-07232002-315-115	115	601B	Metal louvers of cold air return, west entry	< 0.1
997-07232002-315-116	116	601C	Top of light fixture, SE corner	< 0.1
997-07232002-315-117	117	601D	Metal louvers of cold air return, north entry	< 0.1
Building 999				
999-07232002-315-118	B999 – 1	501A	Concrete Floor	< 0.1
999-07232002-315-119	2	500	Concrete Floor	< 0.1
999-07232002-315-120	3	500	Concrete Floor	< 0.1
999-07232002-315-121	4	500	Concrete Floor	< 0.1
999-07232002-315-122	5	500	Concrete Floor	< 0.1
999-07232002-315-123	6	500	Concrete Floor	< 0.1
999-07232002-315-124	7	500A	Concrete Floor	< 0.1
999-07232002-315-125	8	500	Concrete Floor	< 0.1
999-07232002-315-126	9	500B	Concrete Floor	< 0.1
999-07232002-315-127	10	500A	Concrete Floor	< 0.1
999-07232002-315-128	11	500	Concrete Floor	< 0.1
999-07232002-315-129	12	500C	Concrete Floor	< 0.1
999-07232002-315-130	13	500	Concrete Floor	< 0.1
999-07232002-315-131	14	500	Concrete Floor	< 0.1
999-07232002-315-132	15	500C	Concrete Floor	< 0.1
999-07232002-315-133	16	500A	Top of HVAC diffuser	< 0.1
999-07232002-315-134	17	500A	Top of HVAC metal duct	< 0.1
999-07232002-315-135	18	500	HVAC louvers, west wall	< 0.1
999-07232002-315-136	19	500B	Top of light fixture	< 0.1
999-07232002-315-137	20	500C	Top of HVAC metal duct	< 0.1

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($\mu g/100\ cm^2$)
Building 991 East & West Tunnels				
991Tun-07242002-315-101	991Tun – 101	Corridor C	Concrete floor	< 0.1
991Tun-07242002-315-102	102	C	Concrete floor	< 0.1
991Tun-07242002-315-103	103	A	Concrete floor	< 0.1
991Tun-07242002-315-104	104	C	Concrete floor	< 0.1
991Tun-07242002-315-105	105	C	Concrete floor	< 0.1
991Tun-07242002-315-106	106	C	Concrete floor	< 0.1
991Tun-07242002-315-107	107	C	Concrete floor	< 0.1
991Tun-07242002-315-108	108	C	Concrete floor	< 0.1
991Tun-07242002-315-109	109	C	Concrete floor	< 0.1
991Tun-07242002-315-110	110	B	Concrete floor	< 0.1
991Tun-07242002-315-111	111	C	Concrete floor	< 0.1
991Tun-07242002-315-112	112	C	Concrete floor	< 0.1
991Tun-07242002-315-113	113	C	Concrete floor	< 0.1
991Tun-07242002-315-114	114	C	Concrete floor	< 0.1
991Tun-07242002-315-115	115	B	Concrete floor	< 0.1
991Tun-07242002-315-116	116	C	Concrete floor	< 0.1
991Tun-07242002-315-117	117	C	Concrete floor	< 0.1
991Tun-07242002-315-118	118	C	Concrete floor	< 0.1
991Tun-07242002-315-119	119	C	Concrete floor	< 0.1
991Tun-07242002-315-120	120	C	Concrete floor	< 0.1
991Tun-07242002-315-121	121	A	Concrete floor	< 0.1
991Tun-07242002-315-122	122	B	Concrete floor	< 0.1
991Tun-07242002-315-123	123	B	Concrete floor	< 0.1
991Tun-07242002-315-124	124	A	Concrete floor	< 0.1
991Tun-07242002-315-125	125	B	Concrete floor	< 0.1
991Tun-07242002-315-126	126	C	Concrete floor	< 0.1
991Tun-07242002-315-127	127	C	Concrete floor	< 0.1
991Tun-07242002-315-128	128	B	Concrete floor	< 0.1
991Tun-07242002-315-129	129	B	Concrete floor	< 0.1
991Tun-07242002-315-130	130	A	Concrete floor	< 0.1
991Tun-07242002-315-131	131	C	Concrete floor	< 0.1
991Tun-07242002-315-132	132	C	Concrete floor	< 0.1
991Tun-07242002-315-133	133	C	Top of light fixture	< 0.1
991Tun-07242002-315-134	134	C	Top of HVAC metal duct	< 0.1
991Tun-07242002-315-135	135	C	Louvers of HVAC return	< 0.1
991Tun-07242002-315-136	136	C	Top of fluorescent light fixture	< 0.1
991Tun-07242002-315-137	137	C	Top of ACM pipe run	< 0.1
Building 996				
996-07242002-315-101	B996 – 101	401B	Concrete Floor	< 0.1
996-07242002-315-102	102	401D	Concrete Floor	< 0.1
996-07242002-315-103	103	400	Top of tan 9" vinyl floor tile	< 0.1

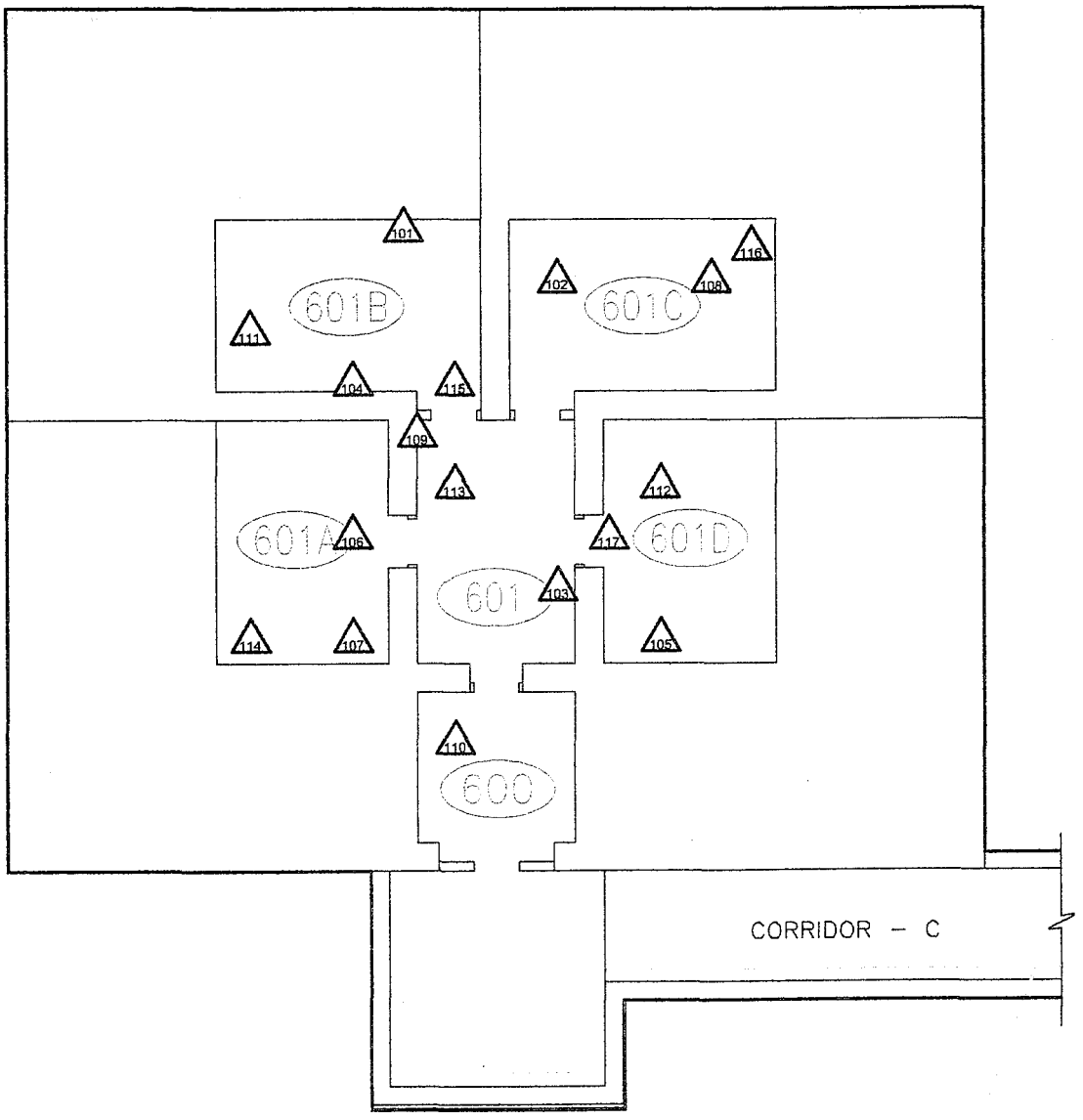
Sample Number	Map Survey Point Location	Room	Sample Location	Result ($\mu g/100\ cm^2$)
996-07242002-315-104	104	401A	Concrete Floor	< 0.1
996-07242002-315-105	105	401A	Concrete Floor	< 0.1
996-07242002-315-106	106	401C	Concrete Floor	< 0.1
996-07242002-315-107	107	401	Concrete Floor	< 0.1
996-07242002-315-108	108	401A	Concrete Floor	< 0.1
996-07242002-315-109	109	400	Top of tan 9" vinyl floor tile	< 0.1
996-07242002-315-110	110	401C	Concrete Floor	< 0.1
996-07242002-315-111	111	401	Concrete Floor	< 0.1
996-07242002-315-112	112	401D	Concrete Floor	< 0.1
996-07242002-315-113	113	401	Top of metal HVAC duct	< 0.1
996-07242002-315-114	114	401C	Top of light fixture	< 0.1
996-07242002-315-115	115	401D	Top of light fixture	< 0.1
996-07242002-315-116	116	401D	Louvers of HVAC supply	< 0.1
996-07242002-315-117	117	401	Top of fluorescent light fixture	< 0.1
			Building 998	
998-07252002-315-101	B998 – 101	300	Concrete floor	< 0.1
998-07252002-315-102	102	300	Concrete floor	< 0.1
998-07252002-315-103	103	300	Concrete floor	< 0.1
998-07252002-315-104	104	300	Concrete floor	< 0.1
998-07252002-315-105	105	300	Top of second tier metal pallet	< 0.1
998-07252002-315-106	106	300	Concrete floor	< 0.1
998-07252002-315-107	107	300	Concrete floor	< 0.1
998-07252002-315-108	108	300	Concrete floor	< 0.1
998-07252002-315-109	109	300	Concrete floor	< 0.1
998-07252002-315-110	110	300	Concrete floor	< 0.1
998-07252002-315-111	111	300	Concrete floor	< 0.1
998-07252002-315-112	112	300	Concrete floor	< 0.1
998-07252002-315-113	113	300	Concrete floor	< 0.1
998-07252002-315-114	114	300	Concrete floor	< 0.1
998-07252002-315-115	115	300	Concrete floor	< 0.1
998-07252002-315-116	116	300	Concrete floor	< 0.1
998-07252002-315-117	117	300	Concrete floor	< 0.1
998-07252002-315-118	118	300	Concrete floor	< 0.1
998-07252002-315-119	119	300	Concrete floor	< 0.1
998-07252002-315-120	120	300	Top of electrical track, east wall	< 0.1
998-07252002-315-121	121	300	Top of electrical track, north wall	< 0.1
998-07252002-315-122	122	300	Top of red fire extinguisher	< 0.1
998-07252002-315-123	123	300	Top of red fire suppression pipe	< 0.1
998-07252002-315-124	124	300	Top of electrical track, south wall	< 0.1
			Ventilation Ducting	
			Building 997/Tunnel	
997-08202002-315-125	Plenum – 125	601A	Above door inside supply line	< 0.1

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($ug/100\ cm^2$)
997-08202002-315-126	126	601A	Above door inside return line	< 0.1
991Tun-08202002-315-127	127	Corridor C	Bottom of supply duct, south end of tunnel	< 0.1
Building 998				
998-08212002-315-128	128	Corridor A	South end of return duct, screw lock access	< 0.1
998-08212002-315-129	129	Corridor A	North end of return duct, behind lower louvers	< 0.1
998-08212002-315-130	130	300	Inside east diffuser of supply duct	< 0.1
Building 991 Tunnel				
991Tun-08222002-315-131	131	Corridor C	Bottom of east side ducting	< 0.1
991Tun-08222002-315-132	132	Corridor C	Bottom of west side ducting	< 0.1
Building 999				
999-08222002-315-133	133	500B	Edge of supply louvers	< 0.1
Building 996				
996-08232002-315-134	134	401B	Bottom of metal ducting, west wall, right louver	< 0.1
996-08232002-315-135	135	401B	Bottom of metal ducting, west wall, left louver	< 0.1
Building 991 Tunnel				
991Tun-08232002-315-136	136	Corridor B	Bottom of metal ducting, east wall	< 0.1
991Tun-08232002-315-137	137	Corridor C	Bottom of metal ducting, west wall	< 0.1
Building 991 West Tunnel (October 8, 2002)				
991-10082002-315-101	101	Trench	In concrete trench, side of tunnel	< 0.1
991-10082002-315-102	102	Trench	In concrete trench, side of tunnel	< 0.1
991-10082002-315-103	103	Trench	In concrete trench, side of tunnel	< 0.1
991-10082002-315-104	104	Trench	In concrete trench, side of tunnel	< 0.1
991-10082002-315-105	105	Trench	In concrete trench, side of tunnel	< 0.1
991-10082002-315-106	106	Trench	In concrete trench, side of tunnel	< 0.1
991-10082002-315-107	107	Trench	In concrete trench, side of tunnel	< 0.1
991-10082002-315-108	108	Trench	In concrete trench by roll-up door at dock	< 0.1
Building 991 Basement (October 8, 2002)				
991-10082002-315-109	109	Utility 2	Top of Cooling Supply line, north tunnel	0.633
991-10082002-315-110	110	Utility 2	On concrete floor, north tunnel	< 0.1
991-10082002-315-111	111	Utility 2	Top of angle iron brace, north tunnel	< 0.1
991-10082002-315-112	112	Utility 2	Top of Sanitary Sewer line, north tunnel	0.118
991-10082002-315-113	113	Utility 2	On concrete floor, north tunnel	0.177
991-10082002-315-114	114	Utility 2	Top of Roof Drain pipe, north tunnel	0.287
991-10082002-315-115	115	Utility 2	Top of fluorescent light fixture, north tunnel	0.331
991-10082002-315-116	116	Utility 2	Top of Roof drain pipe, north tunnel	0.222
991-10082002-315-117	117	Utility 2	On concrete floor, north tunnel	< 0.1

Sample Number	Map Survey Point Location	Room	Sample Location	Result ($\mu g/100\ cm^2$)
991-10082002-315-118	118	Utility 1	On concrete floor, middle of room	< 0.1
991-10082002-315-119	119	Utility 1	Top of fluorescent light fixture	0.104
991-10082002-315-120	120	Utility 2	Top of Sanitary Sewer pipe, east tunnel	< 0.1
991-10082002-315-121	121	Utility 2	Top of fluorescent light fixture, east tunnel	0.177
991-10082002-315-122	122	Utility 2	Electrical junction box, east tunnel	< 0.1
991-10082002-315-123	123	Utility 2	Top of electrical breaker box LBOB-8, south tunnel	0.294
991-10082002-315-124	124	Utility 2	Top of Spray Water Tank # 1, south tunnel	< 0.1
991-10082002-315-125	125	Utility 2	Top of Domestic Cold water pipe, south tunnel	< 0.1
991-10082002-315-126	126	Utility 2	Top of red fire suppression pipe, south tunnel	< 0.1
991-10082002-315-127	127	Utility 2	Top of Domestic Cold water pipe, south tunnel	0.122
991-10082002-315-128	128	Utility 2	Top of angle iron brace, south tunnel	0.154
991-10082002-315-129	129	Utility 2	Top of red fire suppression pipe, south tunnel	< 0.1
991-10082002-315-130	130	Utility 2	Top of fluorescent light fixture, south tunnel	< 0.1
Building 991 Room 150 (October 8, 2002)				
991-10082002-315-131	131	150	Louvers of HVAC return, west wall	< 0.1
991-10082002-315-132	132	150	On 12" floor tile at south wall	< 0.1
991-10082002-315-133	133	150	Top of electrical breaker box M-34, south wall	< 0.1
Building 991 Basement (December 05, 2002)				
991-12052002-315-101	101	North Tunnel, west end	Top of green Cooling Water Supply pipe	0.534
991-12052002-315-102	102	North Tunnel, west end	Top of angle iron brace	0.638
991-12052002-315-103	103	North Tunnel, west end	On concrete floor, at north wall	0.336
991-12052002-315-104	104	North Tunnel, west end	Top of green Domestic Cold Water pipe	0.655
991-12052002-315-105	105	North Tunnel, middle	Top of green Domestic Hot Water Re-circulate pipe	0.210
991-12052002-315-106	106	North Tunnel, middle	On concrete floor by concrete pad	< 0.1
991-12052002-315-107	107	North Tunnel, east end	Top of fluorescent light fixture	0.236
991-12052002-315-108	108	North Tunnel, north wall	Top of yellow natural gas pipe	0.185
991-12052002-315-109	109	East Tunnel, north end	Top of fluorescent light fixture	0.142
991-12052002-315-110	110	East Tunnel, middle	Top of green Cooling Water Supply pipe	< 0.1
991-12052002-315-111	111	East Tunnel, south end	Top of green Cooling Water Supply pipe	< 0.1
991-12052002-315-112	112	South Tunnel, east end	Top of green Cooling Water Return pipe	< 0.1
991-12052002-315-113	113	South Tunnel, east end	On concrete floor at south wall	0.148
991-12052002-315-114	114	South Tunnel, middle	Top of Red Fire Suppression pipe, north wall	< 0.1
991-12052002-315-115	115	South Tunnel, middle	Top of green Tower Water Supply, south wall	< 0.1
991-12052002-315-116	116	South Tunnel, west end	Top of fluorescent light fixture	0.347
991-12052002-315-117	117	South Tunnel, west end	Top of Red Fires Suppression pipe, north wall	0.113
991-12052002-315-118	118	South Tunnel, west end	Top of angle iron brace	< 0.1
991-12052002-315-119	119	South Tunnel, west end	Top of Red Fire Suppression pipe	< 0.1
991-12052002-315-120	120	South Tunnel, west end	On concrete floor, west end	< 0.1
991-12052002-315-121	121	NA	Blank	< 0.1
991-12052002-315-122	122	NA	Blank	< 0.1

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 997



BUILDING 997

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

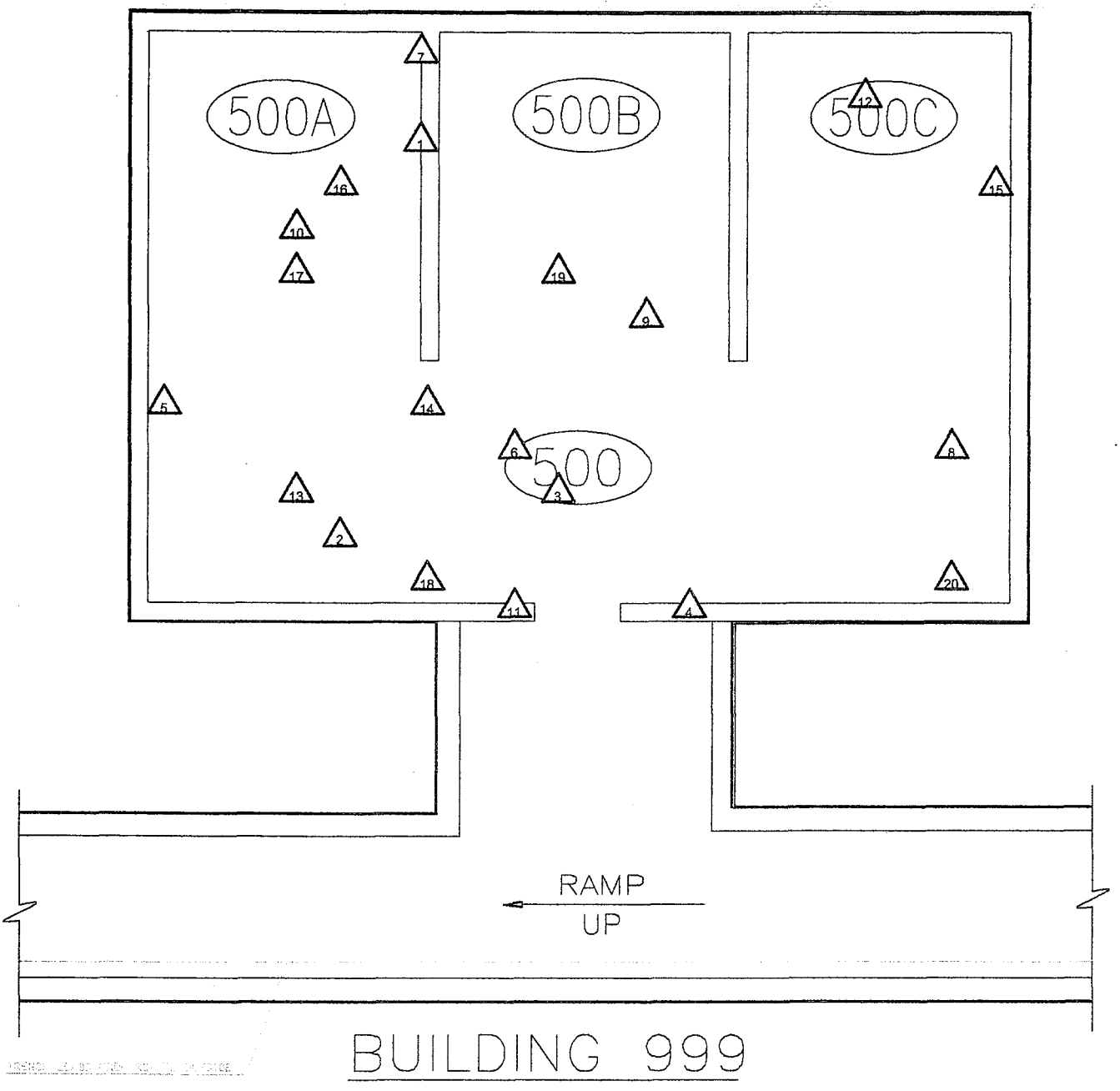
Prepared for: KAISER HILL

MAP ID: 02-0355/997-BE September 4, 2002

217

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 999



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
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Prepared by: GIS Dept. 303-966-7707

Prepared for:

DynCorp
THE ART OF TECHNOLOGY

KAISER HILL

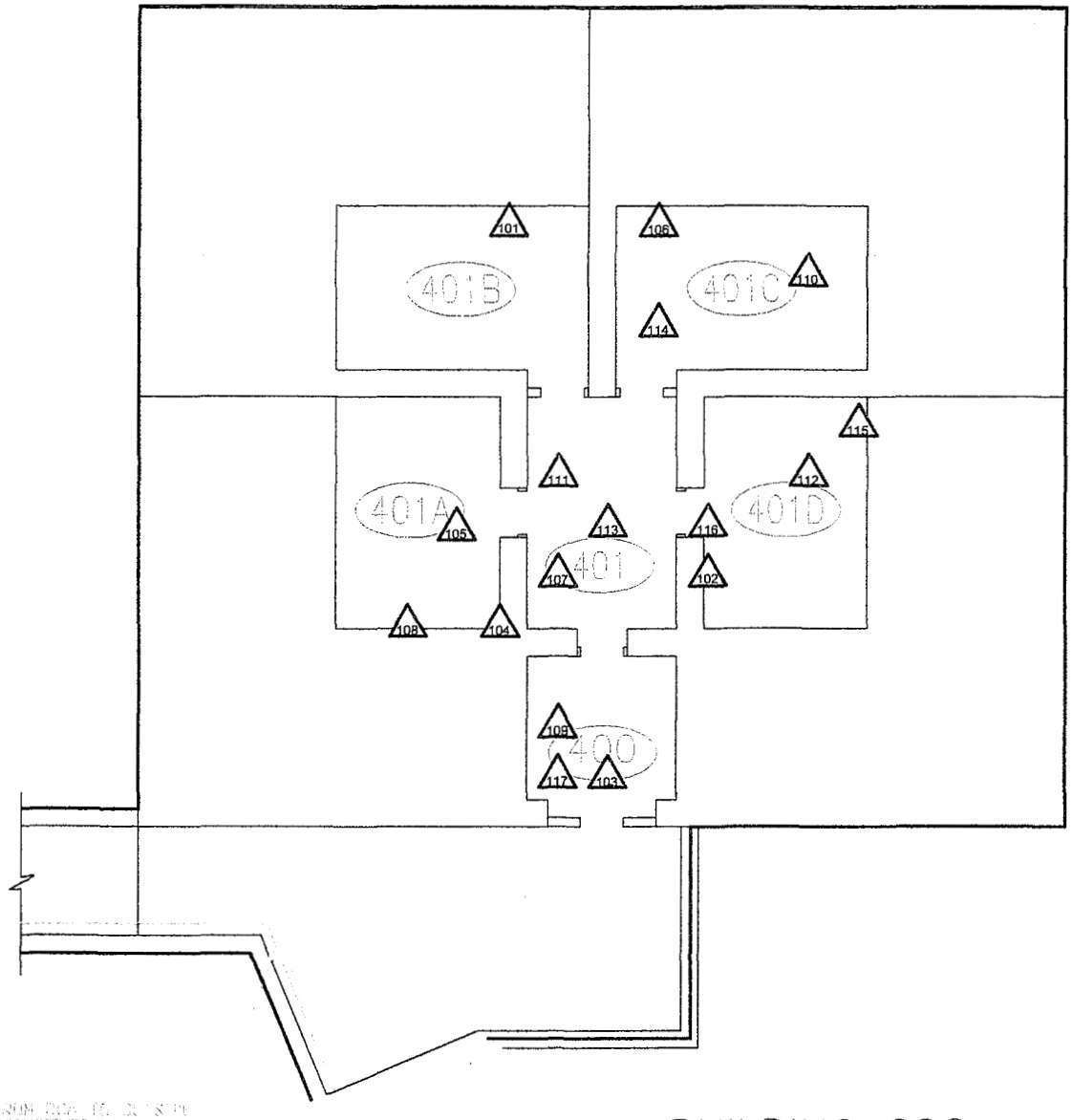
MAP ID: 02-0355/999-BE

September 4, 2002

218

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 996



BUILDING 996

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER-HILL

MAP ID: 02-0355/996-BE

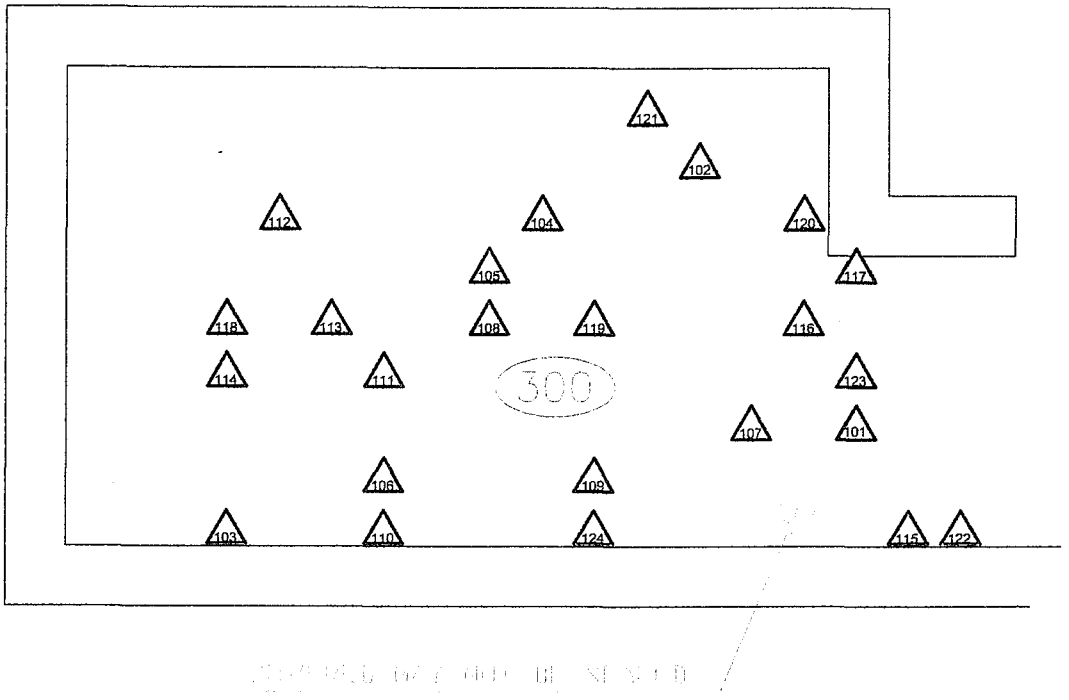
September 4, 2002

220

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 998

BUILDING 998



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

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Rocky Flats Environmental Technology Site

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Prepared for:

DynCorp
THE ART OF TECHNOLOGY

KAISER HILL

MAP ID: 02-0355/998-BE

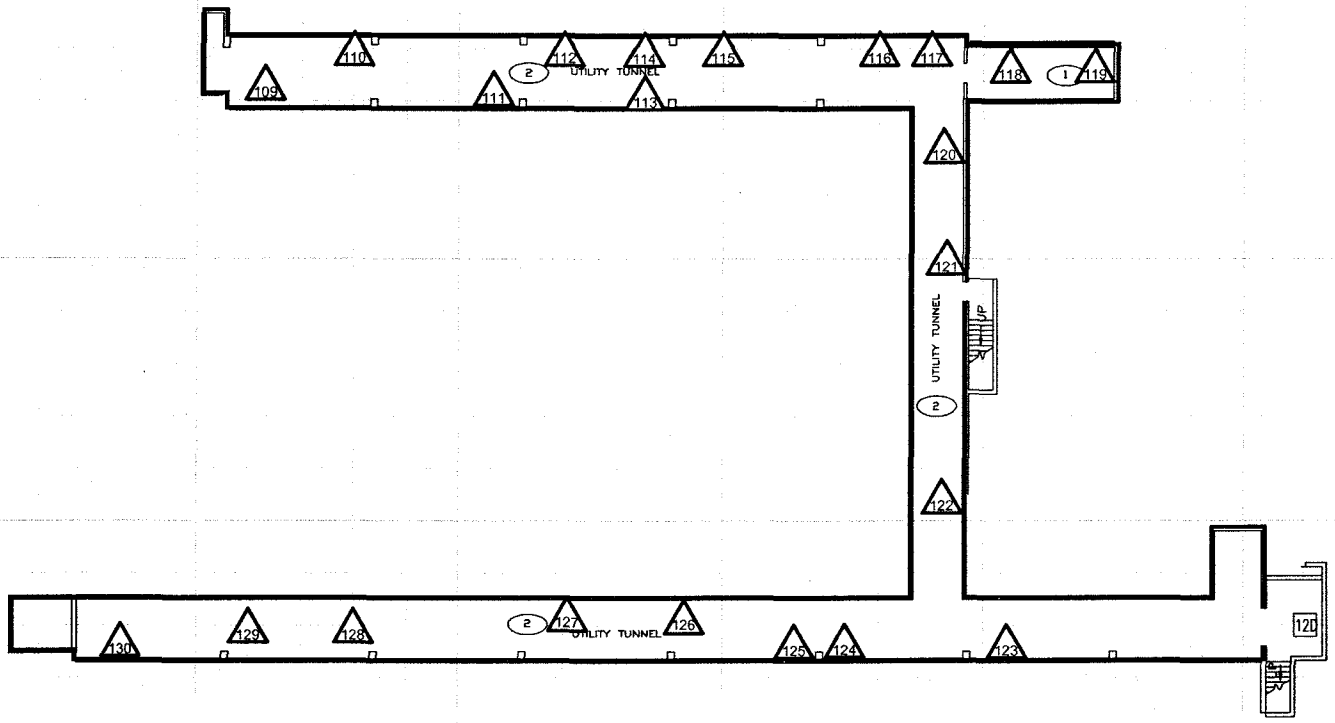
September 4, 2002

221

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Basement Utility Tunnel

October 8, 2002



BLDG 991 BASEMENT FLOOR PLAN

FLOOR ELEVATION 5925'-6"

SURVEY MAP LEGEND

- (#) Asbestos Sample Location
- (#) Beryllium Sample Location
- [#] Lead Sample Location
- ◇# RCRA/CERCLA Sample Location
- (#) PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for:

KAISER·HILL COMPANY

MAP ID: 02-0355/991-BASE-BE

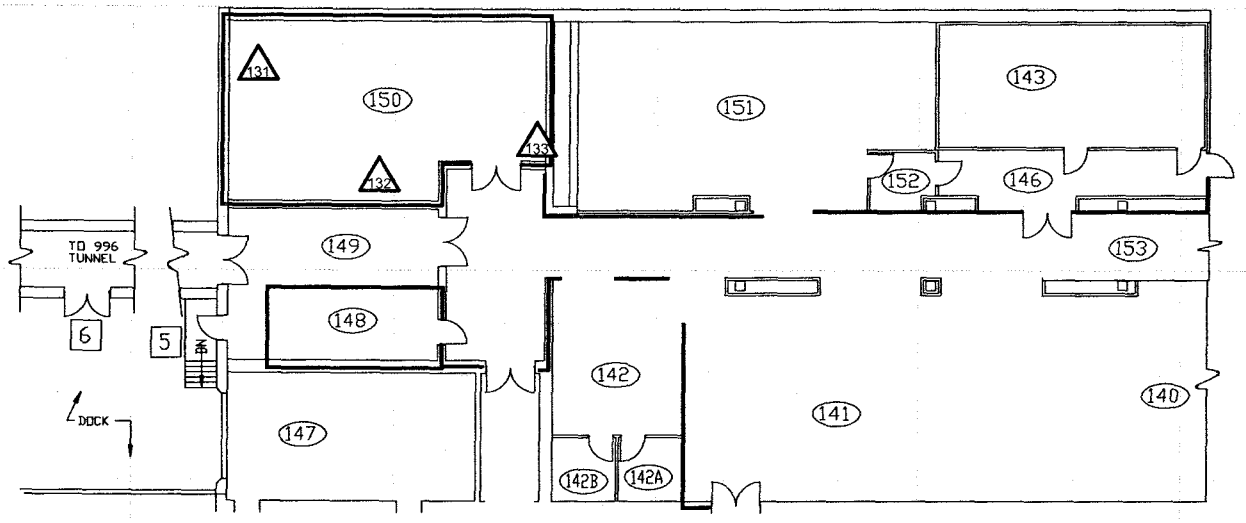
Oct 8, 2002

224

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Room 150

October 8, 2002



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15

0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

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Prepared for: KAISER-HILL COMPANY

MAP ID: 02-0355/991-150

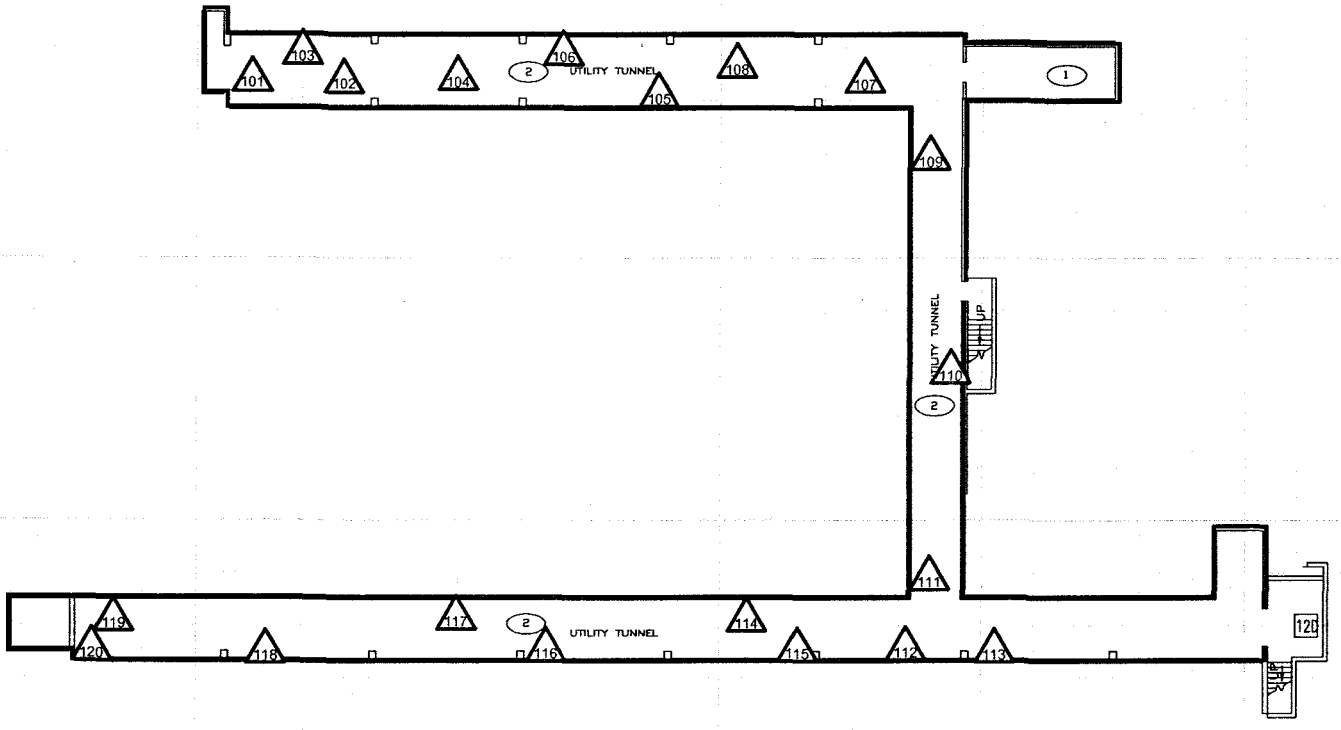
October 8, 2002

225

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Basement Utility Tunnel

December 5, 2002



BLDG 991 BASEMENT FLOOR PLAN

FLOOR ELEVATION 5925'-8"

SURVEY MAP LEGEND

- (#) Asbestos Sample Location
- (#) Beryllium Sample Location
- [#] Lead Sample Location
- (#) RCRA/CERCLA Sample Location
- (#) PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

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THE ART OF TECHNOLOGY

Prepared for:

KAISER-HILL COMPANY

MAP ID: 02-0355/991-BASE-BE2 Dec 13, 2002

226

ATTACHMENT E

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls were implemented throughout the sampling and analysis process, and that any substandard controls resulted in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium and asbestos).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1, beryllium in E-2, and asbestos in E-3. A data completeness summary for all results is given in Table E-4.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project File. The report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Areas. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Survey designs were implemented for the Area 2 Group 2 Cluster facilities based on the transuranic limits used as DCGLs in the unrestricted release decision process. Elevated activity on exterior Survey Unit sample locations had media samples taken and analyzed by ISOCS Canberra gamma spectroscopy; no transuranic isotope activity was detected; elevated activity was determined to be uranium and/or other naturally occurring isotope activity. Consequently, coupon sample results were evaluated against, and were less than the uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limit. Media results were converted to dpm/100cm^2 using the Media Conversion Table, evaluated against the transuranic DCGL limits, and are the values reported. On this basis, elevated transuranic TSA net activity was reported as zero (0) in the TSA exterior data summaries, as appropriate.

Consistent with EPA's G-4 DQO process, the radiological survey design (for those survey units performed per PDS requirements (i.e., building exteriors), was optimized by checking actual measurement results (acquired during PDS) against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

The data presented in this report have been verified and validated relative to quality requirements and project decisions as stated in the original DQOs. All data are useable based on the qualifications stated herein and are considered satisfactory without qualification. The following areas of contamination were identified during this RLC as containing contaminants above unrestricted release levels:

228

- Asbestos characterization sampling conducted as part of this RLCR identified 35 locations of Asbestos Containing Materials (ACM) above unrestricted release levels – B991 (ground floor interior – 33 locations), B991 (basement interior – 1 location) and B991 (roof exterior – 1 location). The ACM included Category 1 and 2 Non-Friable and Friable asbestos. These areas will be abated during in-process decontamination and decommissioning activities and successful decontamination will be confirmed during final asbestos clearance sampling.
- The 991 basement utility tunnel has beryllium contamination above the unrestricted release level of 0.2 μg/100 cm^2 in the B991 basement on overhead utility piping. Beryllium contamination above the unrestricted release level of 0.2 μg/100 cm^2 is also present in portions of the B991 Ventilation System.
- Two media (paint) samples indicated slightly elevated activity above the transuranic and/or uranium DCGL values. All of the elevated media (paint) samples were in a localized area in the northwest corner of Building 991, just outside the reinforced security double-doors leading into the west storage vault tunnel.

The Area 2, Group 2 facilities were characterized for radiological hazards per the RLCP and PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present in the Area 2 Group 2 facilities. All radiological survey/sampling conducted for the Survey Areas and Survey Units comprising this RLCR satisfied RLCP and PDSP DQOs. The nature and extent of radiological characterization was adequately characterized, radiological data is commensurate with the facility typing, data met minimum RLC and PDS quality requirements for action levels and release criteria, and survey areas/units were properly bounded and defined. All investigations were performed in accordance with applicable regulatory requirements and meet the applicable DQOs. Except for the elevated paint sample locations in the northwest corner of Building 991, all elevated radiological activity has been determined to be the result of radon and/or high background interference (Survey Areas). Non DOE-Added material such as uranium or other naturally occurring isotopes (Survey Units) were allowed to decay with all re-survey results less than unrestricted release limits.

Extensive beryllium sampling was conducted in the Area 2 Group 2 Cluster during the period of January 1995 through March 2002, as well as during the RLC effort. Except for the B991 basement/utility and the B991 HEPA filtration unit on the roof, all newly acquired RLC beryllium results were less than the investigative level (0.1 μg/100cm^2). Beryllium smears taken October 8, 2002 identified four (4) locations above the investigative level (0.1 μg/100cm^2) and seven (7) locations above the action level (0.2 μg/100cm^2). Subsequent follow up beryllium sampling conducted December 5, 2002 identified five (5) locations above the investigative level (0.1 μg/100cm^2) and five (5) locations above the action level (0.2 μg/100cm^2) in the basement/utility area confirming a Type 2 facility classification. These areas will be decontaminated and sampled during PDS efforts.

229

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. On this basis, the Survey Units/Survey Areas identified in this RLCR meet the confidences stated herein and confirm project decisions (i.e., a Type 2 classification for 991, and a Type 1 classification for 985, 996, 997, 998, 999 and the B991 west and east storage vault tunnels).

Table E-1 V&V of Radiological Surveys

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	**Measure**	**Frequency**	**COMMENTS**
ACCURACY	initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	field duplicate measurements for TSA	≥5% of real survey points	≥10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Areas A through F and Survey Units 991-B-009 and 991-B-010.	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg.; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	See Table E-4 for details.
SENSITIVITY	detection limits	TSA: ≤100 dpm/100cm^2 RA: ≤20 dpm/100cm^2	all measures	RLC MDAs ≤ 100% $DCGL_w$ Exterior RLC performed to PDS (MDA ≤50% of $DCGL_w$)

Table E-2 V&V of Beryllium Results

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	**Prep: NMAM 7300** **METHOD: OSHA ID-125G**	**LAB ---->**	Johns Manville, Littleton, Co.	
		RIN ---->	RIN02Z0828 RIN03Z0091 (10/8/02) RIN03Z0532 (12/5/02)	
QUALITY REQUIREMENTS		**Measure**	**Frequency**	**COMMENTS**
ACCURACY	**Calibrations** Initial	linear calibration	≥1	No qualifications significant enough to change project decisions, i.e., a Type 2 classification for B991, and a Type 1 Classification for 985, 996, 997, 998, 999 and the 991 tunnels.
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks - lab & field	<MDL	≥1	
	Interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	Field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	Hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	Measurement units	ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	Detection limits	MDL of 0.012 ug/100cm^2	all measures	

Table E-3 V&V of Asbestos Results

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
ASBESTOS	METHOD: EPA 600/R-93/116	LAB ---->	Reservoirs Environmental, Inc	
QUALITY REQUIREMENT		RIN ---->	RIN02Z0828	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial/continuing	below detectable amounts	≥1	Semi-quantitative, per (microscopic) visual estimation.
PRECISION	Actual Number Sampled LCSD Lab duplicates	all below detectable amounts	≥ 94 samples	Semi-quantitative, per (microscopic) visual estimation.
REPRESENTATIVENESS	COC	Qualitative	NA	Chain-of-Custody intact: completed paperwork, containers w/ custody seals.
	Hold times/preservation	Qualitative	NA	N/A
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	See original Chemical Characterization Package (planning document); for field/sampling procedures (located in project file;) thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Measurement Units	% by bulk volume	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	Qualitative	NA	See Table E-4, final number of samples at Certified Inspector's discretion.
SENSITIVITY	Detection limits	<1% by volume	all measures	N/A

Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Asbestos	B991 Ground Floor (interior)	90 biased (interior)	78 biased (interior)	ACM present > 1% by volume (33 locations >1% by volume)	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN02Z0828 Thirty three (33) locations identified as ACM > 1% by volume – range of 3% to 65% Chrysotile, 2% to 20% Amosite and trace to 1.75 point count
Asbestos	B991 Basement (interior)	5 biased (interior)	8 biased (exterior)	ACM present > 1% by volume (1 locations >1% by volume)	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN02Z0828 One (1) location of ACM > 1% by volume – 65% Chrysotile
Asbestos	B991 Roof (exterior)	5 biased (interior)	3 biased (exterior)	ACM present > 1% by volume (1 locations >1% by volume)	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN02Z0828 One (1) location of ACM > 1% by volume – 3% Chrysotile and 1.75 point count, silver paint.
Asbestos	B991 Tunnel (interior)	7 biased (interior)	3 biased (interior)	No ACM present, all results < 1% by volume	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN02Z0828
Asbestos	B985 (interior)	7 biased (interior)	1 biased (interior)	No ACM present, all results < 1% by volume	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN02Z0828
Asbestos	B997 (interior)	7 biased (interior)	1 biased (interior)	No ACM present, all results < 1% by volume	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN02Z0828

Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	B991 Tunnels	32 random/5 biased	32 random/5 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G – RIN02Z0829 No results above the action level (0.2 µg/100cm^2) or the investigative level (0.1 µg/100cm^2).
Beryllium	B991 Tunnel Plenum Access	0 samples	13 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G – RIN02Z0829 No results above the action level (0.2 µg/100cm^2) or the investigative level (0.1 µg/100cm^2).
Beryllium	B991 (Oct. 8, 2002) • Basement/Utility • Room 150 • Tunnel West Trench (Dec. 5, 2002) • Basement/Utility	 • 0 samples • 0 samples • 0 samples • 0 samples	 • 22 biased • 3 biased • 8 biased (interior) • 20 biased (interior)	Beryllium contamination found above the investigative level (0.1 µg/100cm^2) and action level (0.2 µg/100cm^2)	10CFR850; OSHA ID-125G RIN03Z0091 (October 8, 2002): Identified four (4) locations in the basement utility above the investigative level (0.1 µg/100cm^2) and seven (7) locations above the action level (0.2 µg/100cm^2). RIN03Z0532 (Dec. 5, 2002): Follow up sampling confirmed five (5) locations above the investigative level (0.1 µg/100cm^2) and five (5) locations in the basement utility above the action level (0.2 µg/100cm^2). Historical IHIS data indicates beryllium contamination above the action level (0.2 µg/100cm^2) in portions of the 991 Ventilation System. The above locations will be decontaminated and successful decontamination per unrestricted release levels and will be confirmed during PDS.
Beryllium	B996 (interior)	17 random/5 biased	12 random/5 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G – RIN02Z0829 No results above the action level (0.2 µg/100cm^2) or the investigative level (0.1 µg/100cm^2).

Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	B997 (interior)	12 random/5 biased	12 random/5 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G – RIN02Z0829 No results above the action level (0.2 µg/100cm^2) or the investigative level (0.1 µg/100cm^2).
Beryllium	B998 (interior)	12 random/5 biased	19 random/5 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G – RIN02Z0829 No results above the action level (0.2 µg/100cm^2) or the investigative level (0.1 µg/100cm^2).
Beryllium	B999 (interior)	19 random/5 biased	15 random/5 biased (interior)	No contamination found at any location	10CFR850; OSHA ID-125G – RIN02Z0829 No results above the action level (0.2 µg/100cm^2) or the investigative level (0.1 µg/100cm^2).
Radiological	Survey Area A 991 1st Floor (interior)	• 45 α β TSA and 45 α β Smears (uniform & biased – floors and walls <2 m) • 15 α β TSA and 15 α β Smears (biased – ceiling and walls >2 m) • 45 α TSA and 45 β	• 45 α β TSA and 45 α β Smears (uniform – floors and walls <2 m) • 15 α β TSA and 15 α β Smears (biased – ceiling and walls >2 m) • 45 α TSA and 45 β Smears	No contamination at any location; all values below unrestricted release levels (However, 59 survey locations had elevated readings due to radon and/or high background interference)	Uranium and/or Transuranic DCGL as applicable. 2 elevated α sample locations > DCGL$_w$ (100 dpm/100cm^2) @ floor and walls <2 m. Smears were taken at the elevated α sample locations, allowed to decay, and re-surveyed. All re-survey smear results were less than the DCGL$_w$ (100 dpm/100cm^2) unrestricted release limits and confirms no DOE-Added materials. Elevated activity is determined to be the result of high radon levels. Although the original survey results reflect radon interference, the original survey results are reported. Elevated β activity > DCGL$_w$ (5,000 dpm/100cm^2) at the following sample locations: • 8 samples @ floors and walls < 2m • 3 samples @ walls and ceilings > 2m

Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
		Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m	(biased - equipment) 1 m^2 scan @ each location-floors and walls < 2 m		• 12 sample on equipment Elevated β activity > $DCGL_{EMC}$ (15,000 dpm/100cm^2) at the following sample locations: • 19 samples @ floors and walls < 2m • 3 samples @ walls and ceilings > 2m • 12 sample on equipment The elevated β activity at these locations is attributed to high background levels from waste drum storage in the surrounding building areas. Although the original survey results reflect high background interference, the original survey results are reported.
Radiological	Survey Area B B991 1st Floor (interior)	• 30 ά β TSA and 30 ά β Smears (uniform & biased – floors and walls <2 m) • 10 ά β TSA and 10 ά β Smears (biased – ceiling and walls >2 m)	• 30 ά β TSA and 30 ά β Smears (uniform – floors and walls <2 m) • 10 ά β TSA and 10 ά β Smears (biased – ceiling and walls >2 m)	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable.

Table E-4 Data Completeness Summary					
ANALYTE	**Building/Area/Unit**	**Sample Number Planned (Real & QC)**	**Sample Number Taken (Real & QC)**	**Project Decisions (Conclusions) & Uncertainty**	**Comments (RIN, Analytical Method, Qualifications, etc.)**
		• 30 ά TSA and 30 β Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m	• 30 ά TSA and 30 β Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m		
Radiological	Survey Area C B991 1st Floor (interior)	• 30 ά β TSA and 30 ά β Smears (uniform & biased – floors and walls <2 m) • 10 ά β TSA and 10 ά β Smears (biased – ceiling and walls >2 m)	• 30 ά β TSA and 30 ά β Smears (uniform – floors and walls <2 m) • 10 ά β TSA and 10 ά β Smears (biased – ceiling and walls >2 m)	No contamination at any location; all values below unrestricted release levels (However, 3 survey locations had elevated readings due to radon)	Uranium and/or Transuranic DCGL as applicable. Elevated β activity at one (1) sample location > $DCGL_w$ (5,000 dpm/100cm^2) @ floor and walls >2 m and two (2) elevated β sample locations > $DCGL_{EMC}$ (15,000 dpm/100cm^2) @ floor and walls <2 m. The elevated β activity at these locations is attributed to high background levels from waste drum storage in the surrounding building areas. Although the original survey results reflect high background interference, the original survey results are reported.

Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
		• 30 ά TSA and 30 β Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m	• 30 ά β TSA and 30 ά β Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m		
Radiological	Survey Area D B991 Basement (interior)	• 30 ά β TSA and 30 ά β Smears (uniform & biased-floors & walls <2m • 10 ά β TSA and 10 ά β Smears (biased – ceiling and walls >2 m) • 30 ά TSA and 30 β Smears (biased-equipment)	• 30 ά β TSA and 30 ά β Smears (uniform – floors and walls <2 m) • 10 ά β TSA and 10 ά β Smears (biased – ceiling and walls >2 m) • 30 ά β TSA and 30 ά β Smears (biased-equipment)	No contamination at any location; all values below unrestricted release levels (However, 12 survey location had elevated readings due to radon and/or high background interference)	Uranium and/or Transuranic DCGL as applicable. Elevated ά activity at 3 sample locations > $DCGL_w$ (100 dpm/100cm^2) @ floor and walls <2 m and elevated ά activity at 8 sample locations > $DCGL_w$ (300 dpm/100cm^2) on equipment. Smears were taken at the elevated ά sample locations, allowed to decay, and re-surveyed. All re-survey smear results were less than the $DCGL_w$ (100 dpm/100cm^2) unrestricted release limits and confirms no DOE-Added materials. Elevated activity is determined to be the result of high radon levels. Although the original survey results reflect radon interference, the original survey results are reported. Elevated β activity at one sample location on equipment > $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits. The elevated β activity at this location is attributed to high background levels from waste drum storage in the

Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
		1 m^2 scan @ each location-floors and walls < 2 m	1 m^2 scan @ each location-floors and walls < 2 m		surrounding building areas. Although the original survey results reflect high background interference, the original survey results are reported.
Radiological	Survey Area E B996, B997, B998 and B999 (interior)	• 45 ά β TSA and 45 ά β Smears (uniform & biased – floors and walls <2 m) • 15 ά β TSA and 15 ά β Smears (biased – ceiling and walls >2 m) • 45 ά TSA and 45 β Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m	• 45 ά β TSA and 45 ά β Smears (uniform – floors and walls <2 m) • 15 ά β TSA and 15 ά β Smears (biased – ceiling and walls >2 m) • 45 ά β TSA and 45 ά β Smears (biased-equipment) • 30 ά β TSA and 30 ά β smears	All locations were below unrestricted release levels, except for a small localized area just outside the West Tunnel Security Double Doors where two paint samples were elevated above the unrestricted release levels. (16 survey location had elevated readings due to radon and/or high background interference)	Uranium and/or Transuranic DCGL as applicable. Elevated ά activity > $DCGL_w$ (100 dpm/100cm^2) at the following sample locations: • One (1) sample location on floors and walls < 2m • One (1) sample location on walls and ceiling > 2m • Five (5) sample locations on equipment • Two (2) pre-media sample location and One (1) post media sample location > $DCGL_w$ (100 dpm/100cm^2). Smears were taken at the elevated ά sample locations, allowed to decay, and re-surveyed. All re-survey smear results were less than the $DCGL_w$ (100 dpm/100cm^2) unrestricted release limits and confirms no DOE-Added materials. Elevated activity is determined to be the result of high radon levels. Although the original survey results reflect radon interference, the original survey results are reported. Elevated β activity > $DCGL_w$ (5,000 dpm/100cm^2) at the following sample locations: • One (1) sample location on floors and walls < 2m • Two (2) sample locations on equipment • One (1) elevated β pre-media sample location > $DCGL_{EMC}$ (15,000 dpm/100cm^2) and One (1) elevated β post media sample location > $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits.

Table E-4 Data Completeness Summary					
ANALYTE	**Building/Area/Unit**	**Sample Number Planned (Real & QC)**	**Sample Number Taken (Real & QC)**	**Project Decisions (Conclusions) & Uncertainty**	**Comments (RIN, Analytical Method, Qualifications, etc.)**
			(pre & post media) (20 random/10 biased) • 30 media-paint samples (20 random/10 biased) • 11 ά β TSA and 11 ά β smears (biased-ventilation) • 60 ά TSA and 60 ά smears (30 pre & 30 post media/biased) 1 m^2 scan @ each location-floors and walls < 2 m.		The elevated β activity at this location is attributed to elevated background levels from waste drum storage in the surrounding building areas. Although the original survey results reflect high background interference, the original survey results are reported. Pre-TSA paint sample location #30 (34,982 dpm/100cm^2) had elevated β above 5,000 dpm/100cm^2 $DCGL_W$. The paint sample location #30 was analyzed by gamma spectroscopy, no transuranic isotopes were detected. Location #30 activity was determined to be uranium and other naturally occurring isotopes and result was less than the uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits. The elevated TSA β activity at this location is attributed to elevated background levels from waste drum storage in the surrounding building areas. Although the original TSA survey results reflect high background interference, the original TSA survey result is reported. Two elevated media samples (#44 and #50) greater than the transuranic $DCGL_w$ (100 dpm/100cm^2) and the uranium $DCGL_w$ (5,000 dpm/100cm^2). Refer to section 3.0 *Radiological Characterization and Hazards* of this RLC for discussion.

Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area F B985 (interior)	• 30 á β TSA and 30 á β Smears (uniform & biased – floors and walls < 2 m.) • 10 á β TSA and 10 á β Smears (biased – ceiling and walls >2 m) • 30 á TSA and 30 β Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m	• 30 á β TSA and 30 á β Smears (uniform – floors and walls <2 m.) • 10 á β TSA and 10 á β Smears (biased – ceiling and walls >2 m) • 30 á β TSA and 30 á β Smears (biased-equipment) 1 m^2 scan @ each location-floors and walls < 2 m	No contamination at any location; all values below unrestricted release levels (However, 1 survey location had elevated activity due to radon interference)	Uranium and/or Transuranic DCGL as applicable. Elevated á activity at one (1) sample location > $DCGL_w$ (100 dpm/100cm^2) @ walls and ceilings > 2m. A smear was taken at the elevated á sample location, allowed to decay, and re-surveyed. The re-survey smear result was less than the $DCGL_w$ (100 dpm/100cm^2) unrestricted release limits and confirms no DOE-Added materials. Elevated activity is determined to be the result of high radon levels. Although the original survey results reflect radon interference, the original survey results are reported.

Table E-4 Data Completeness Summary					
ANALYTE	**Building/Area/Unit**	**Sample Number Planned (Real & QC)**	**Sample Number Taken (Real & QC)**	**Project Decisions (Conclusions) & Uncertainty**	**Comments (RIN, Analytical Method, Qualifications, etc.)**
Radiological	Survey Area B Survey Unit: 991-B-009 B991 (exterior)	65 ά TSA and 65 ά Smears (54 random/11 biased) 4 TSA QC	73 ά TSA and 73 ά Smears (54 random/19 biased) 4 TSA QC	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. • Elevated ά activity was identified at four (4) sample locations (#'s 5, 52, 58 and 73) on the metal flashing of roof exterior. A coupon sample was taken at the highest reading and analyzed by gamma spectroscopy. No transuranic isotopes were detected. Activity was determined to be uranium or other naturally occurring isotopes and result was less than the uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits. On this basis, the transuranic net activity value for the four locations are reported as zero (0) in the TSA Data Summary. All results are less than the applicable DCGLs. • Media samples collected from locations #'s 71, 72, 28, 37 and 46) due to elevated ά activity. Samples were analyzed by gamma spectroscopy. No transuranic isotope activity detected. Results were converted to dpm/100cm^2 using the Media Sample Conversion sheet. The highest calculated uranium value was 38 dpm/100cm^2 which is less than the uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits. On this basis, locations #71 and 72 are reported as zero (0) net activity in the TSA Data Summary. Similar investigation for media samples 28, 37 and 46 resulted in a calculated uranium value of 120.3 dpm/100cm^2 (< uranium $DCGL_w$ 5,000 dpm/100cm^2) and a calculated transuranic value of 23.0 dpm/100cm^2 (< transuranic $DCGL_w$ 100 dpm/100cm^2). As the above 3 locations are co located and from similar media, 23.0 dpm/100cm^2 is the net activity reported for each location in the TSA Data Summary.

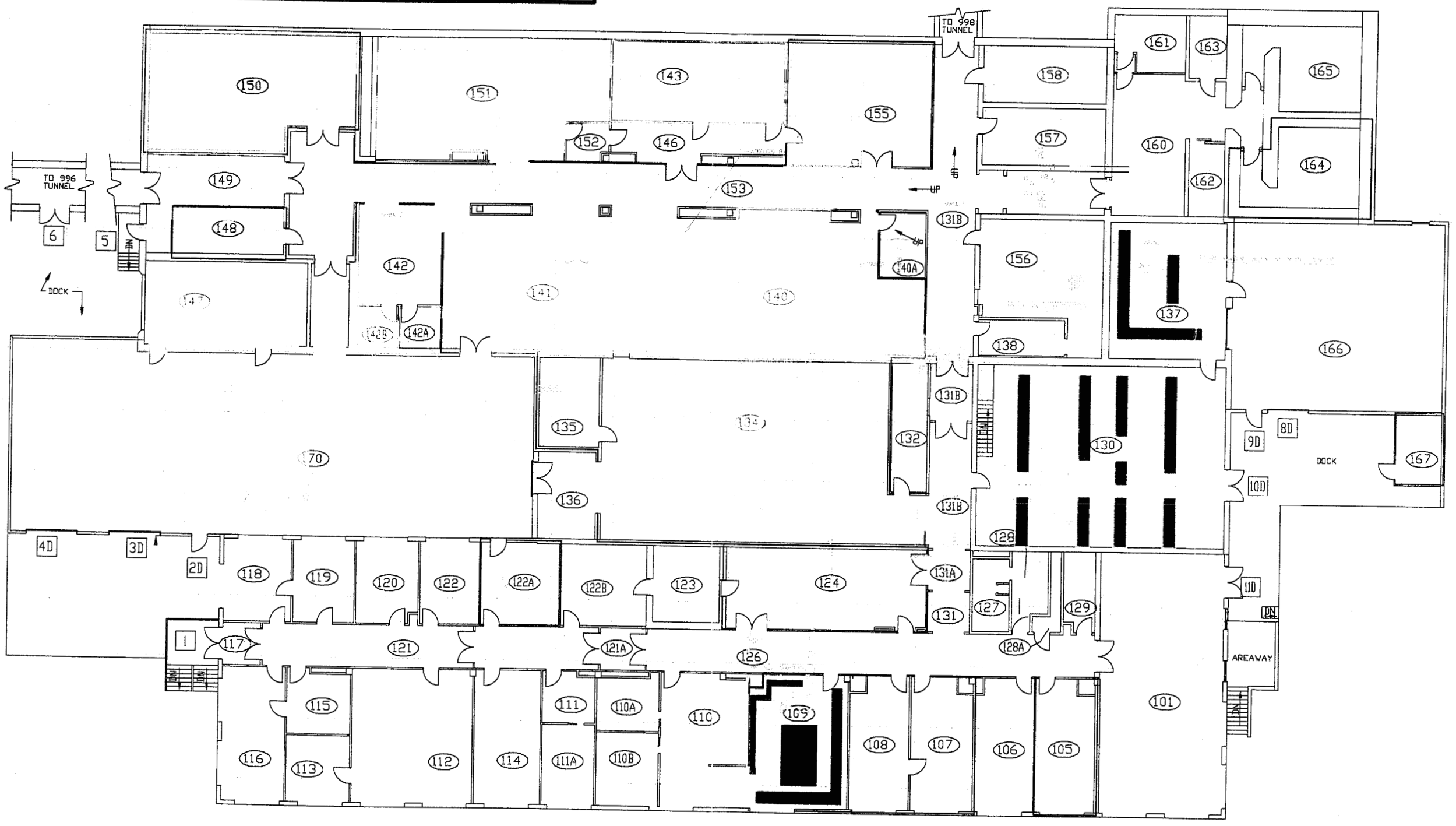
Table E-4 Data Completeness Summary

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area B Survey Unit: 991-B-010 B985 (exterior)	20 á TSA and 20 á Smears (15 random/5 biased) 2 TSA QC	20 á TSA and 20 á Smears (15 random/5 biased) 2 TSA QC 3% scan	No contamination at any location; all values below unrestricted release levels	Uranium and/or Transuranic DCGL as applicable. Initial elevated activity at locations #2 and #17 (118 dpm/100cm^2 at each location) greater than the DCGL$_w$ (100 dpm/100cm^2). Locations were allowed to decay and re-surveyed. Both re-survey results (#2 – 33.7 dpm/100cm2 and #17 – 20.0 dpm/100cm^2) were less than the Transuranic DCGL$_w$ (100 dpm/100cm^2). The re-survey results are the sample net activity reported in the TSA Data Summary. All results are less than the applicable DCGLs, therefore, no further investigation is required.

[A] Number of asbestos samples required is an estimate only, final number of samples is at the discretion of IH.

PRE-DEMOLITION SURVEY FOR BUILDING 991

Survey Area: N/A **Survey Unit:** N/A **Classification:** 3
Building: 991 - Type 2
Survey Unit Description: Inaccessible Storage Areas
Total Area: N/A sq. m. **Total Floor Area:** N/A sq. m.



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit
- Inaccessible Drum Storage Areas

N

0 FEET 40
0 METERS 10

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s): _____

U.S. Department of Energy
Rocky Flats Environmental Technology Site

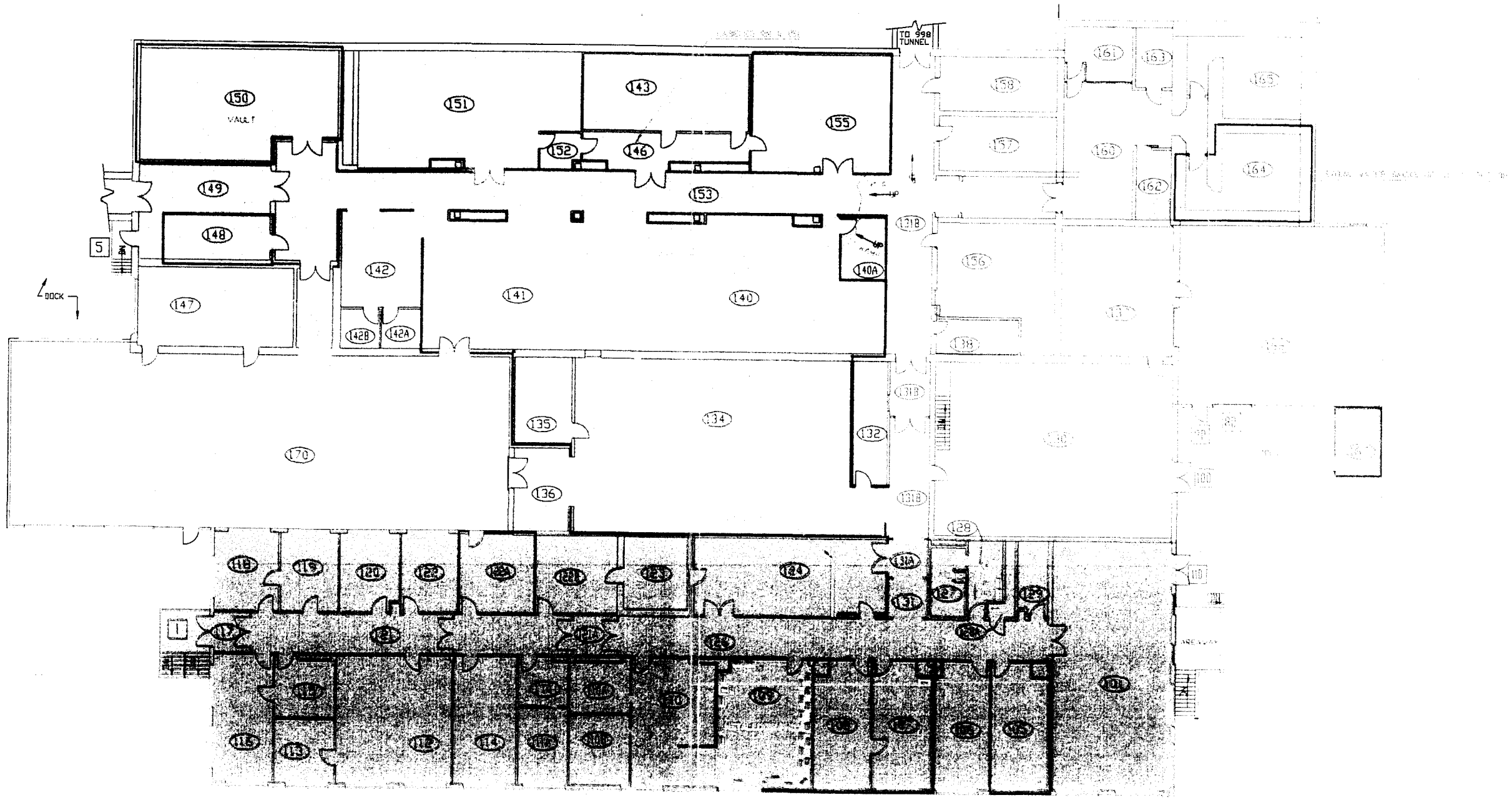
Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY KAISER-HILL

MAP ID: 02-0355/991-INACC-2 September 16, 2002

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: N/A **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: 991 Ground Floor Plan
Total Area: N/A sq. m. **Total Floor Area: 3300 sq. m.**



- Survey Area A 1472 sq. m.
- Survey Area B 934 sq. m.
- Survey Area C 889 sq. m.
- Survey Area D 500 sq. m.
- Survey Area E 1446 sq. m.
- Survey Area F 210 sq. m.

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

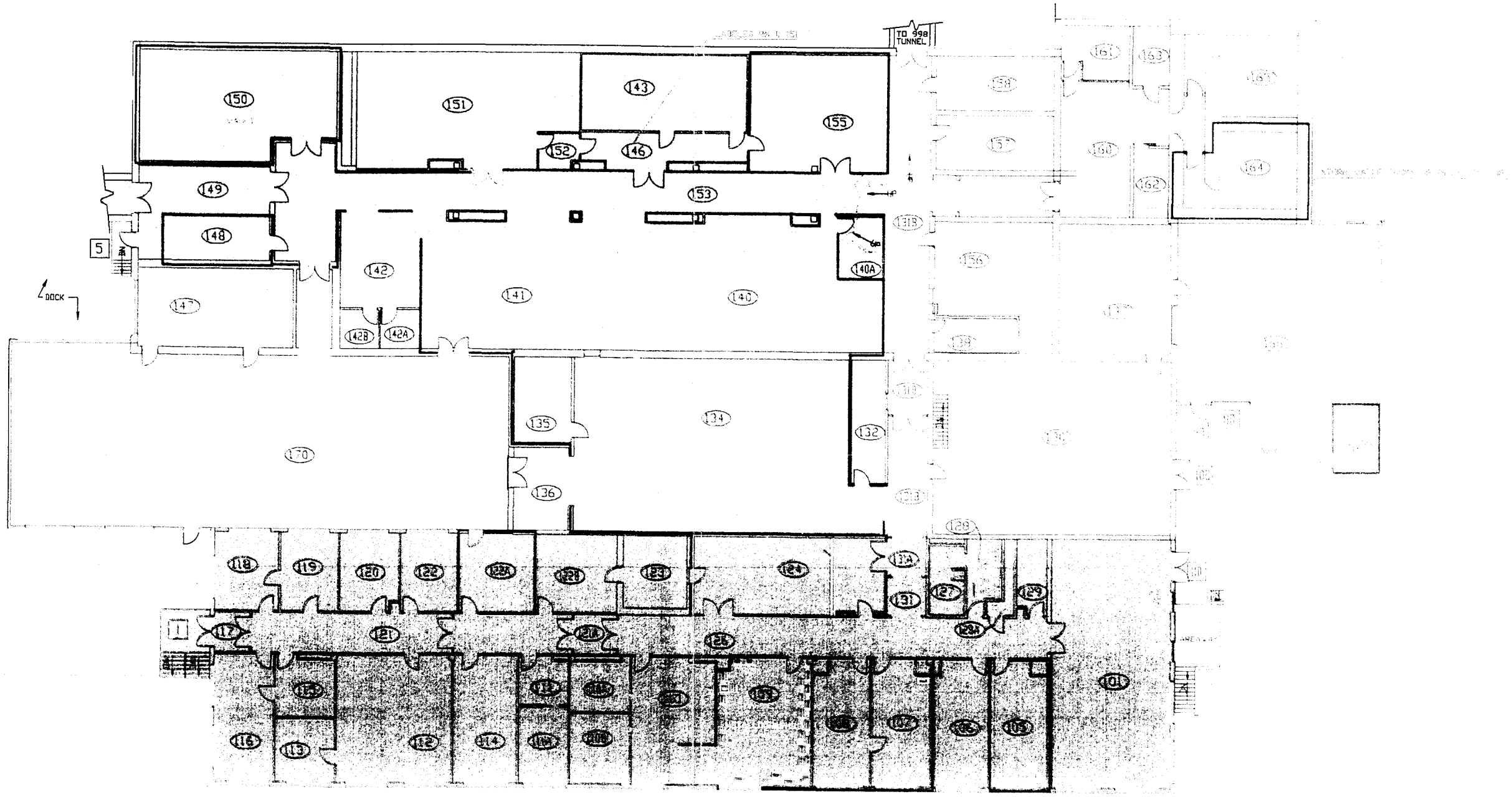
KAISER HILL

MAP ID: 02-0335/991-GRND-C February 12, 2002

37

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: N/A **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: 991 Ground Floor Plan
Total Area: N/A sq. m. **Total Floor Area: 3300 sq. m.**



Survey Area	
A	1472 sq. m.
B	934 sq. m.
C	889 sq. m.
D	500 sq. m.
E	1446 sq. m.
F	210 sq. m.

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

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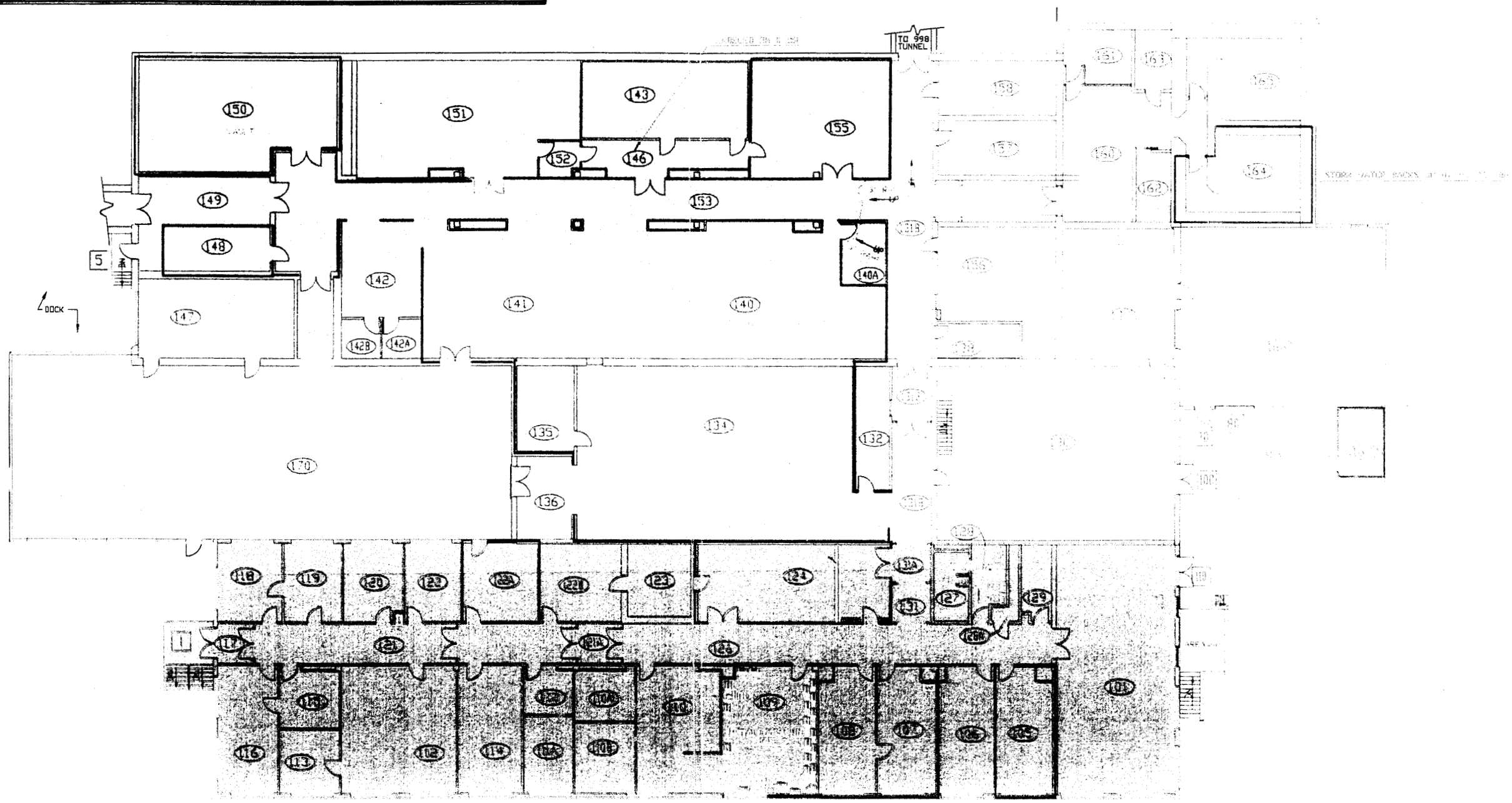
KAISER-HILL COMPANY

MAP ID: 02-0335/991-GRND-C February 12, 2002

49

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: N/A **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: 991 Ground Floor Plan
Total Area: N/A sq. m. **Total Floor Area: 3300 sq. m.**



Survey Area A
1472 sq. m.
Survey Area B
934 sq. m.
Survey Area C
889 sq. m.
Survey Area D
500 sq. m.
Survey Area E
1446 sq. m.
Survey Area F
210 sq. m.

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

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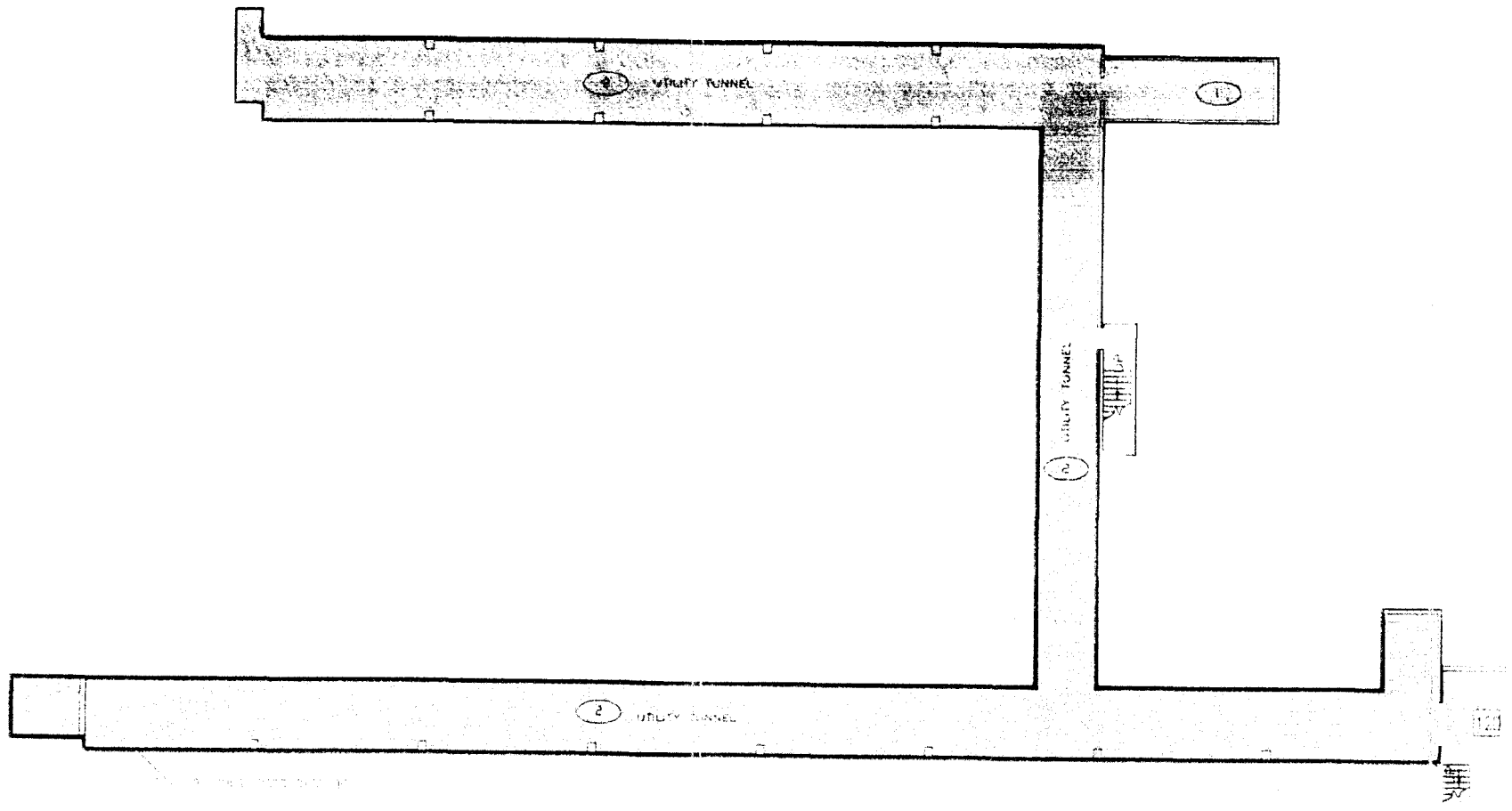
MAP ID: 02-0335/991-GRND-C February 12, 2002

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: D **Survey Unit: N/A** **Classification: N/A**
Building: 991
Survey Unit Description: 991 Basement Floor Plan
Total Area: N/A sq. m. **Total Floor Area: 500 sq. m.**



Survey Area A
1472 sq. m.
Survey Area B
934 sq. m.
Survey Area C
889 sq. m.
Survey Area D
500 sq. m.
Survey Area E
1446 sq. m.
Survey Area F
210 sq. m.

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): N/A
RCT ID #(s): N/A

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Prepared by: GIS Dept. 303-966-7707

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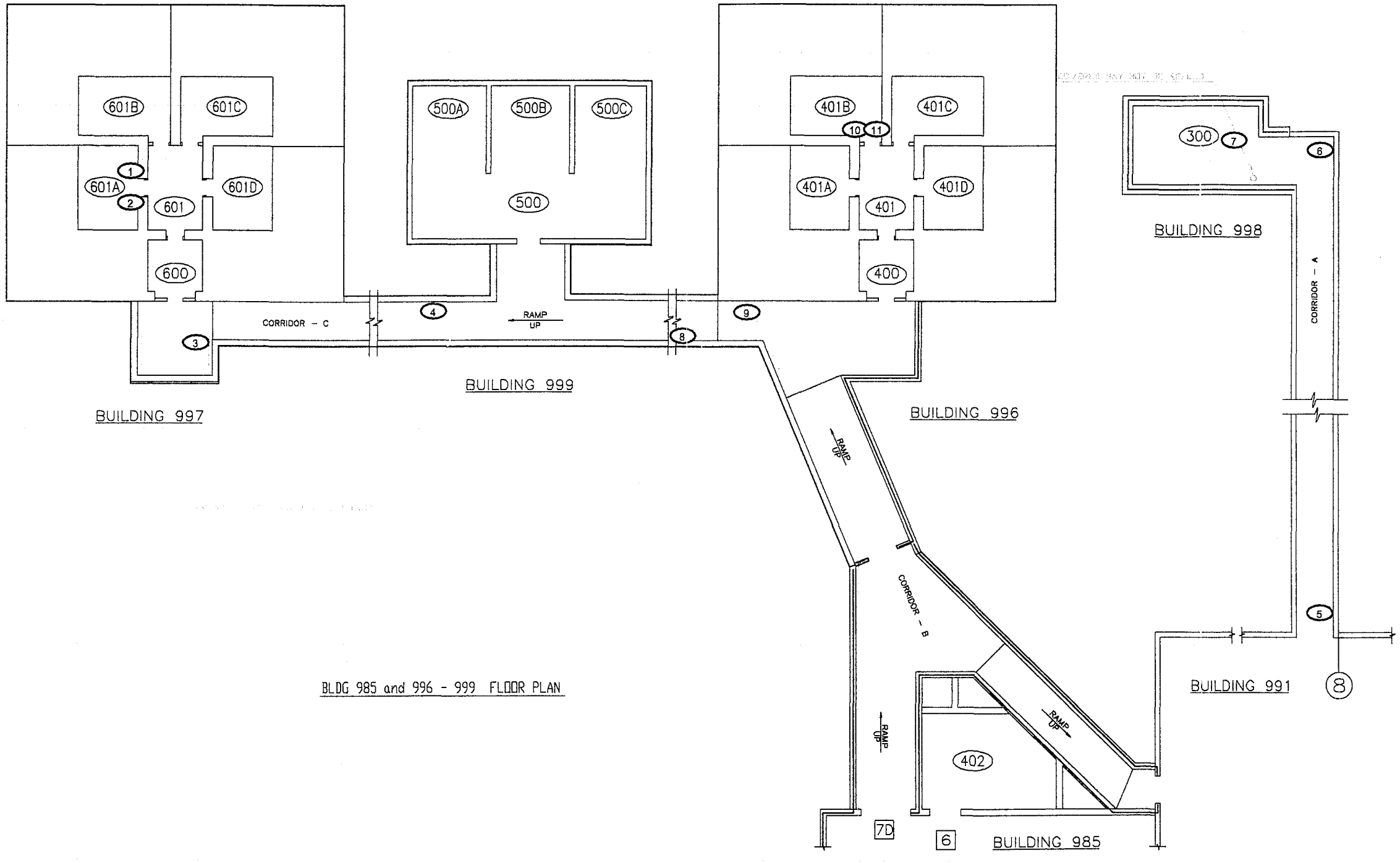
Prepared for:
KAISER HILL

MAP ID: 02-0355/991-BASE-C

April 8, 2002

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: E **Survey Unit: N/A** **Classification: 3**
Building: 991 Tunnel
Survey Unit Description: Ventilation Ducts
Total Area: N/A sq. m. **Total Floor Area: N/A sq. m.**



BLDG 985 and 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s): _____

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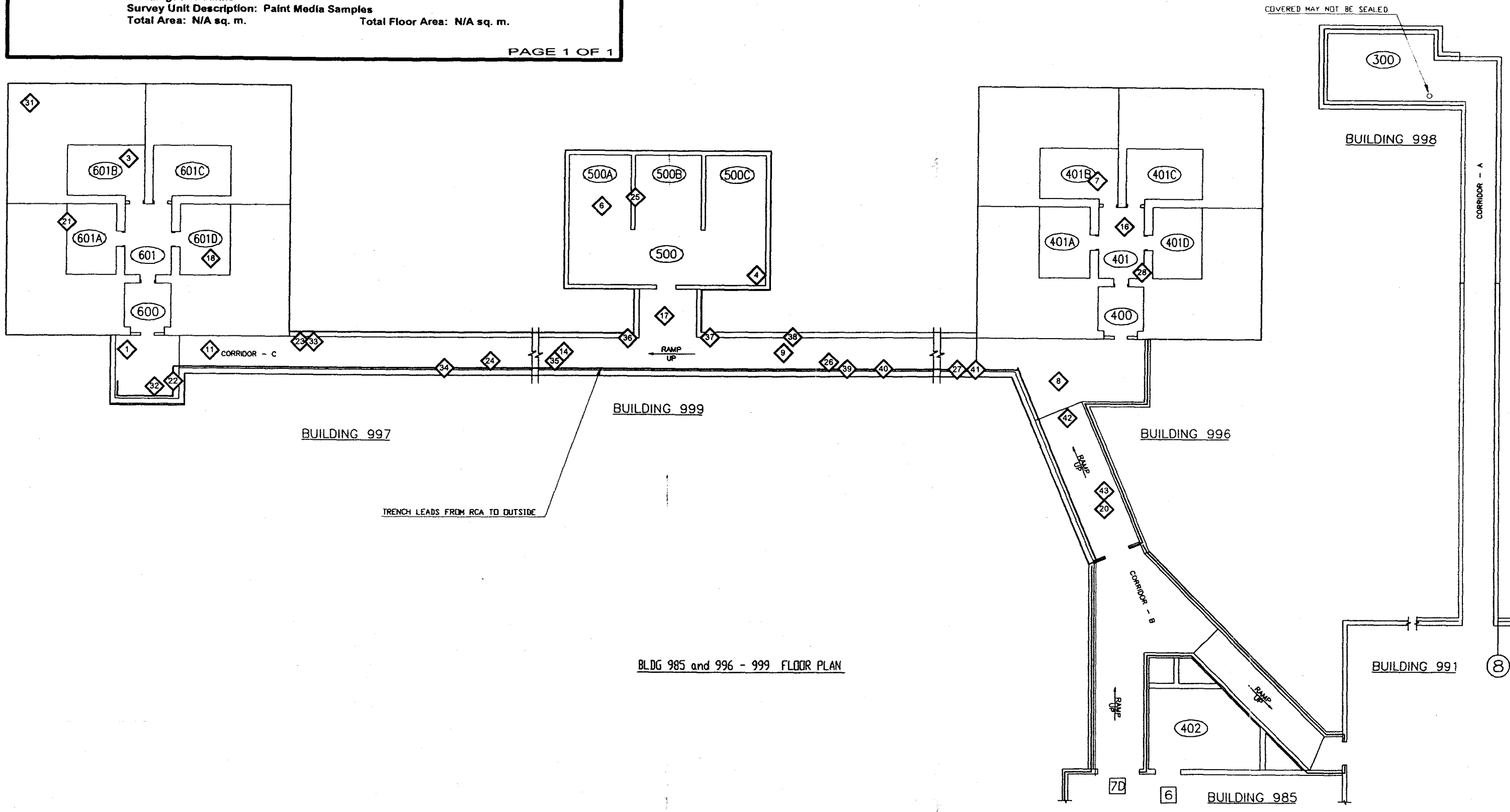
KAISER HILL

MAP ID: 02-0355/991-Plenum September 4, 2002

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: E **Survey Unit: N/A** **Classification: 3**
Building: 991 Tunnel
Survey Unit Description: Paint Media Samples
Total Area: N/A sq. m. **Total Floor Area: N/A sq. m.**



BLDG 985 and 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s): _____

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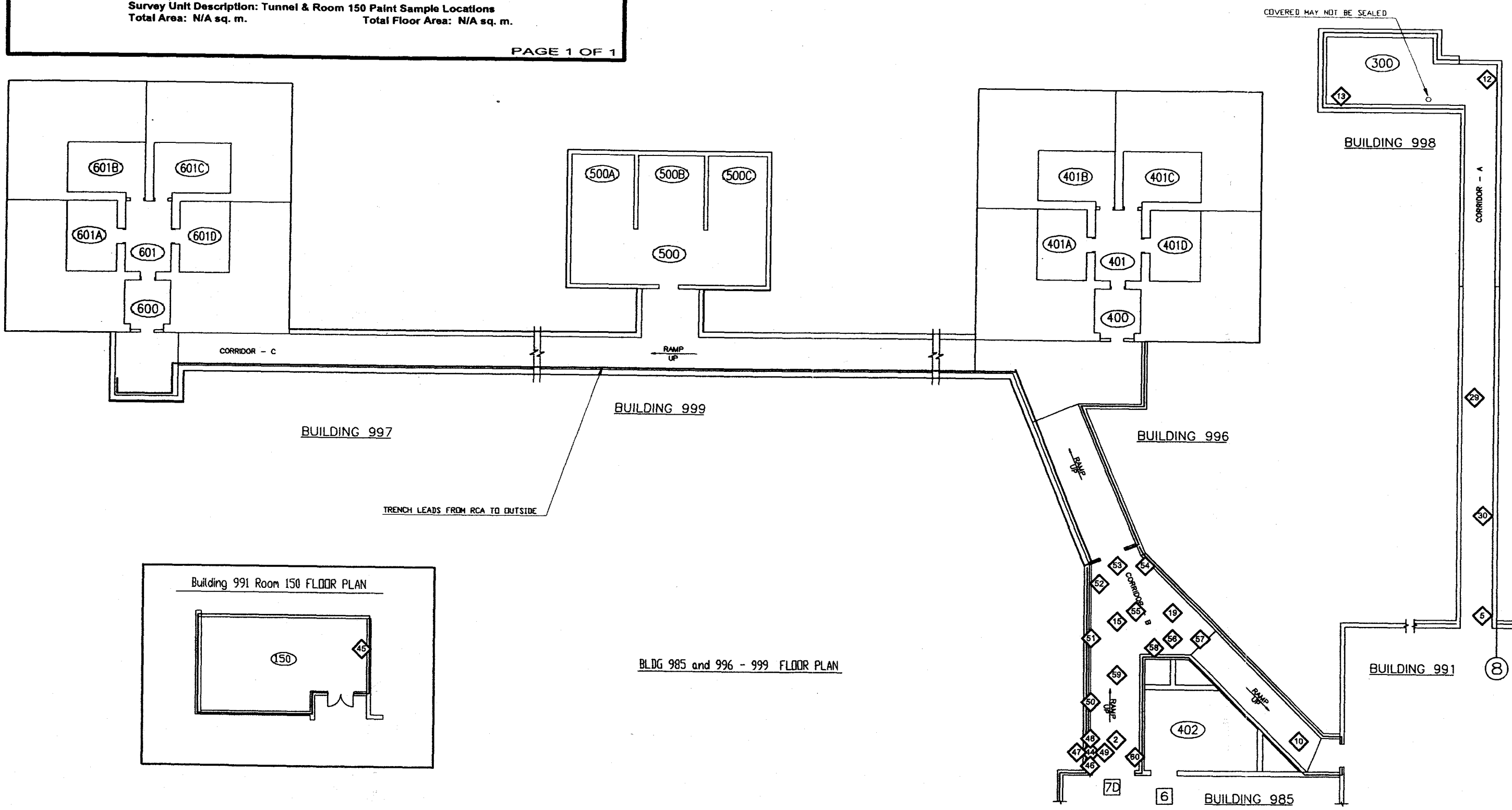
Prepared for: KAISER-HILL

MAP ID: 02-0355/991TUN-WST

Jan 8, 2003

RECONNAISSANCE LEVEL CHARACTERIZATION FOR 991 CLUSTER

Survey Area: E **Survey Unit:** N/A **Classification:** N/A
Building: 991, 996, 997, 998 & 999
Survey Unit Description: Tunnel & Room 150 Paint Sample Locations
Total Area: N/A sq. m. **Total Floor Area:** N/A sq. m.



Building 991 Room 150 FLOOR PLAN

BLDG 985 and 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0
0 METERS 0

DRAWING NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s): _____

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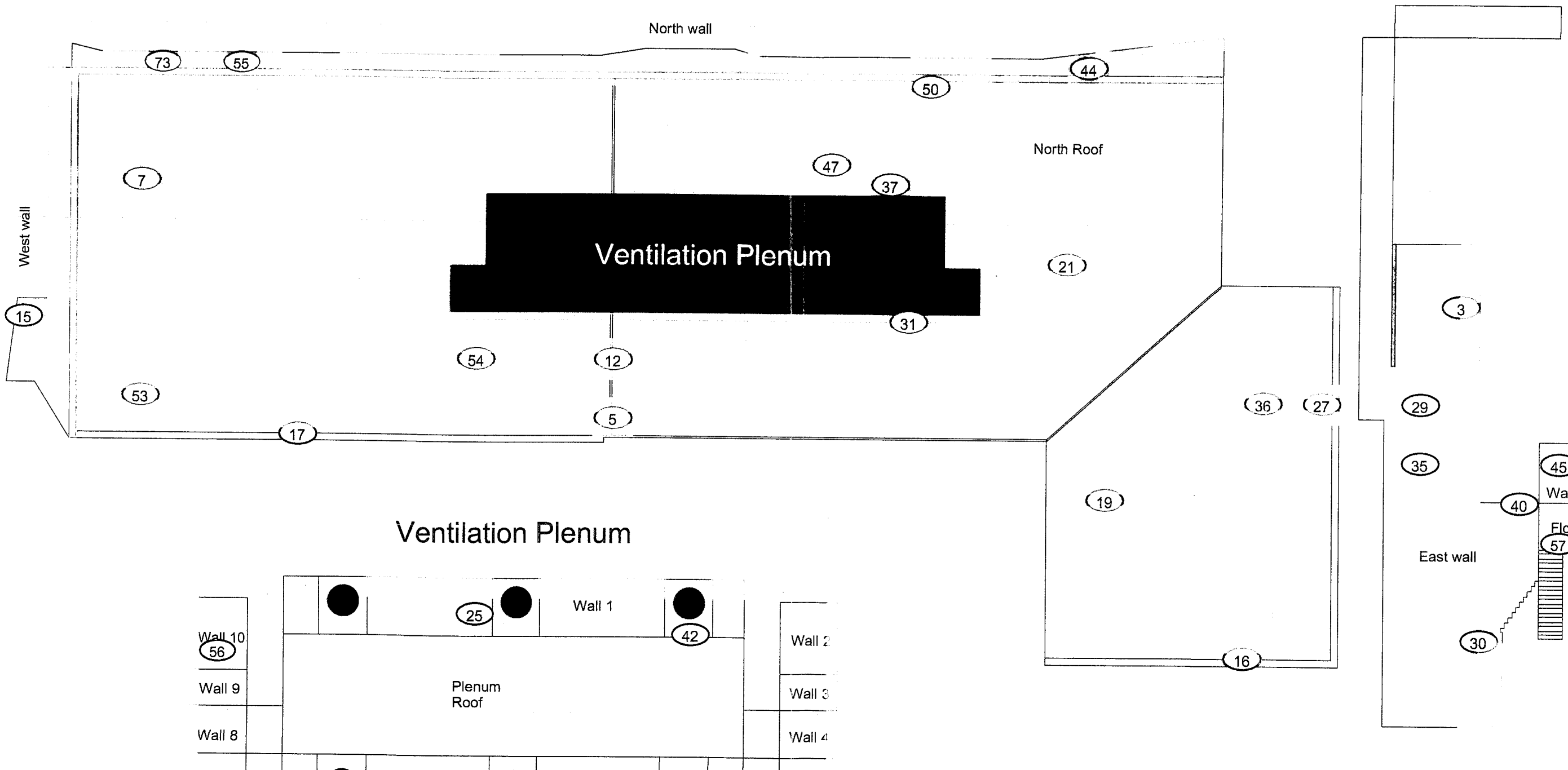
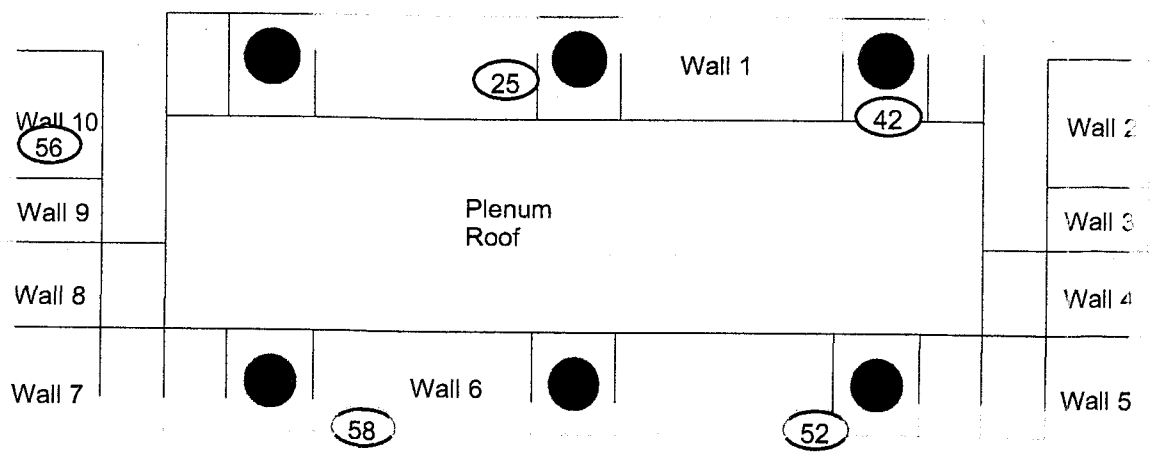
MAP ID: 02-0355/991TUN-EST Jan 8, 2003

PRE-DEMOLITION SURVEY FOR 991 CLUSTER

Survey Area: B **Survey Unit: 991-B-009** **Classification: 3**
Building: 991
Survey Unit Description: Exterior of Building
Total Area: 6134 sq. m. **Total Floor Area: 3598 sq. m.**



Ventilation Plenum



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

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N

Scan Survey Information
Survey Instrument ID #(s): 7, 13, 14, 15, 26
RCT ID #(s): 1, 2, 3, 4, 5

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

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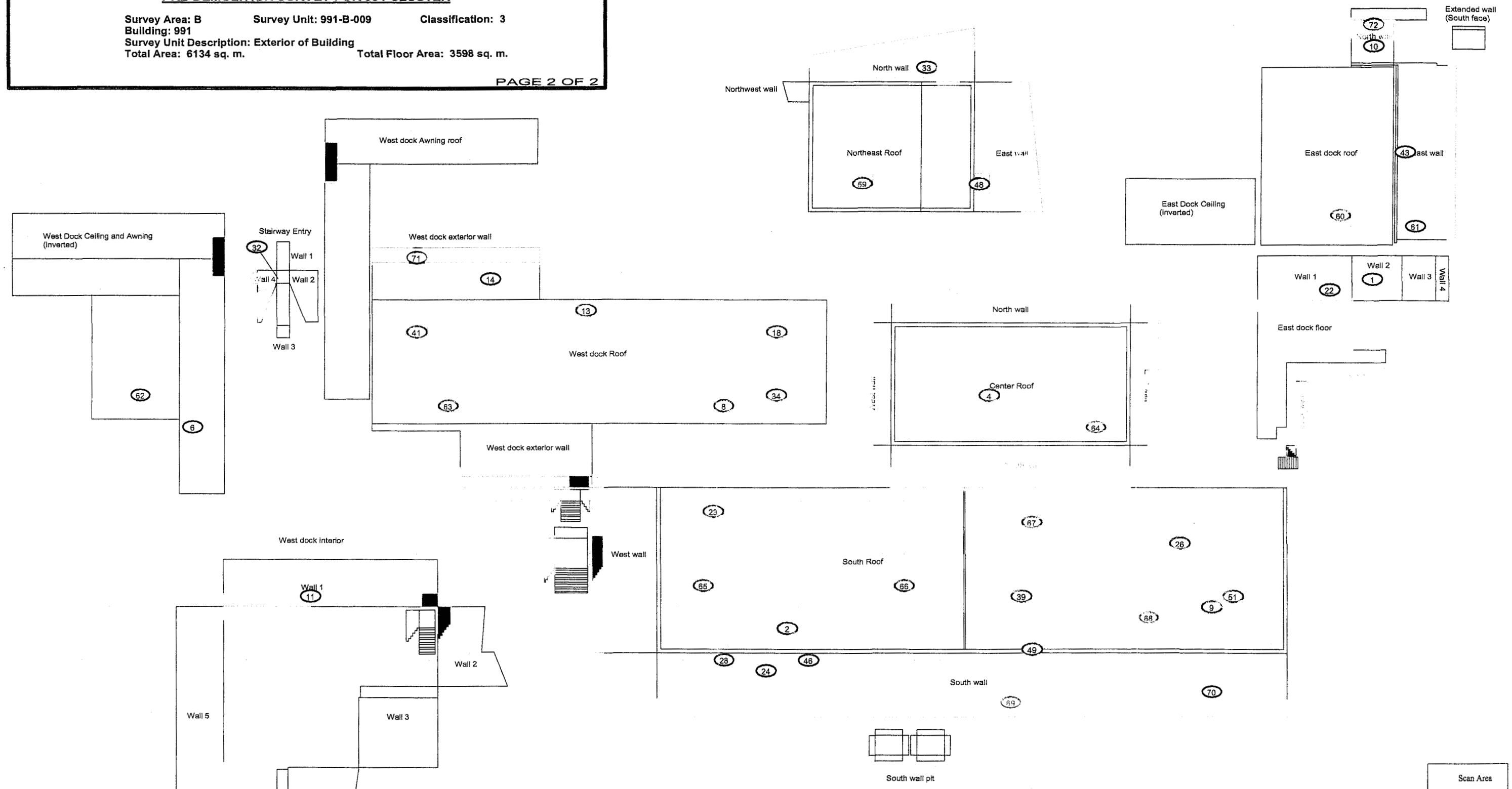
MAP ID: 02-0355/991-EX-1SC

April 17, 2002

167

PRE-DEMOLITION SURVEY FOR 991 CLUSTER

Survey Area: B **Survey Unit: 991-B-009** **Classification: 3**
Building: 991
Survey Unit Description: Exterior of Building
Total Area: 6134 sq. m. **Total Floor Area: 3598 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 40
0 METERS 10

1 inch = 30 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s): 7, 13, 14, 15, 26
RCT ID #(s): 1, 2, 3, 4, 5

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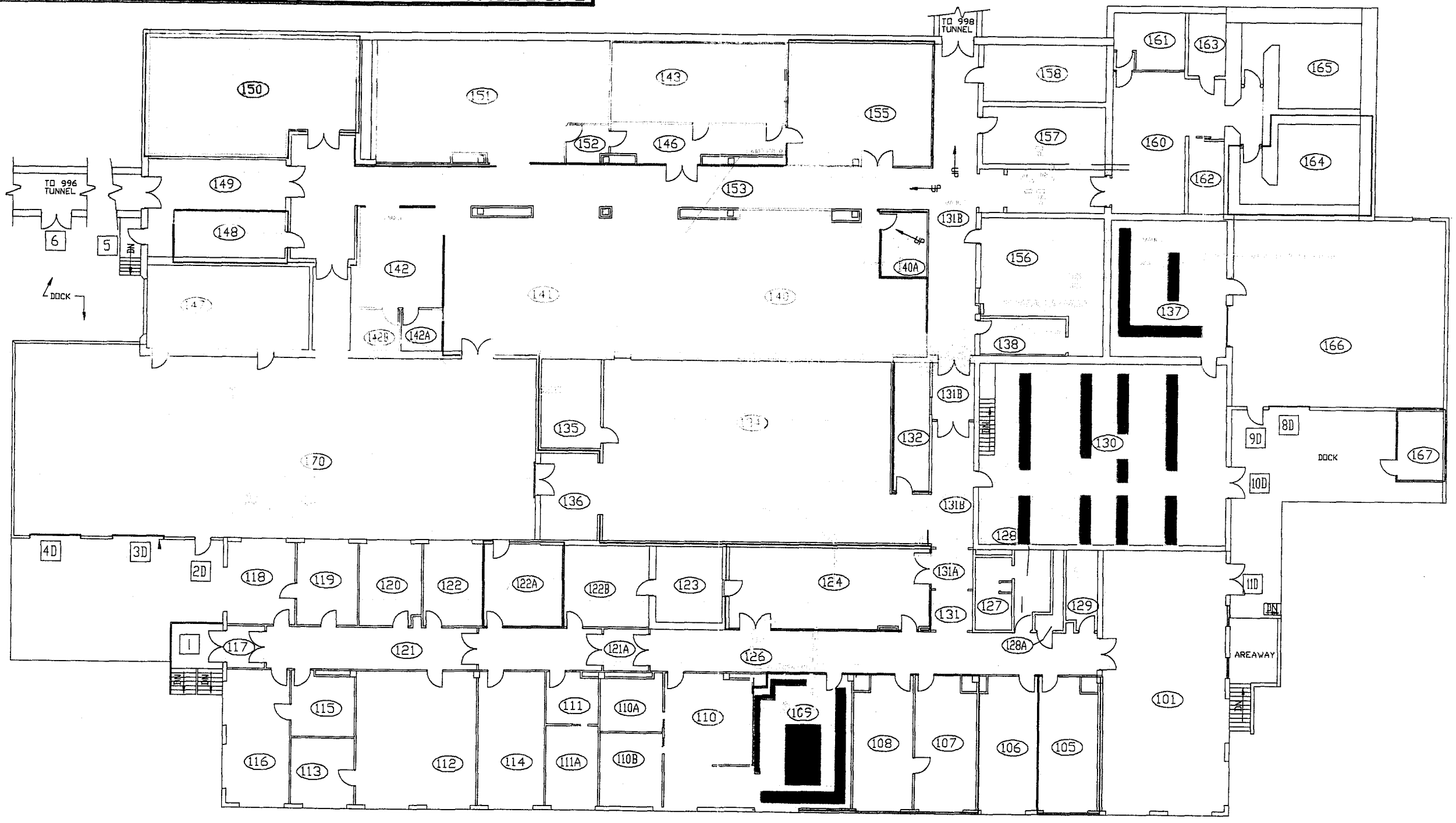
MAP ID: 02-0355/991-EX-2SC April 17, 2002

163

PRE-DEMOLITION SURVEY FOR BUILDING 991

Survey Area: N/A **Survey Unit:** N/A **Classification:** 3
Building: 991 - Type 2
Survey Unit Description: Inaccessible Storage Areas
Total Area: N/A sq. m. **Total Floor Area:** N/A sq. m.



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit
- Inaccessible Drum Storage Areas

N

0 FEET 40
0 METERS 10

Scan Survey Information
Survey Instrument ID #(s): _____
RCT ID #(s):

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Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-968-7707 Prepared for:

DynCorp THE ART OF TECHNOLOGY

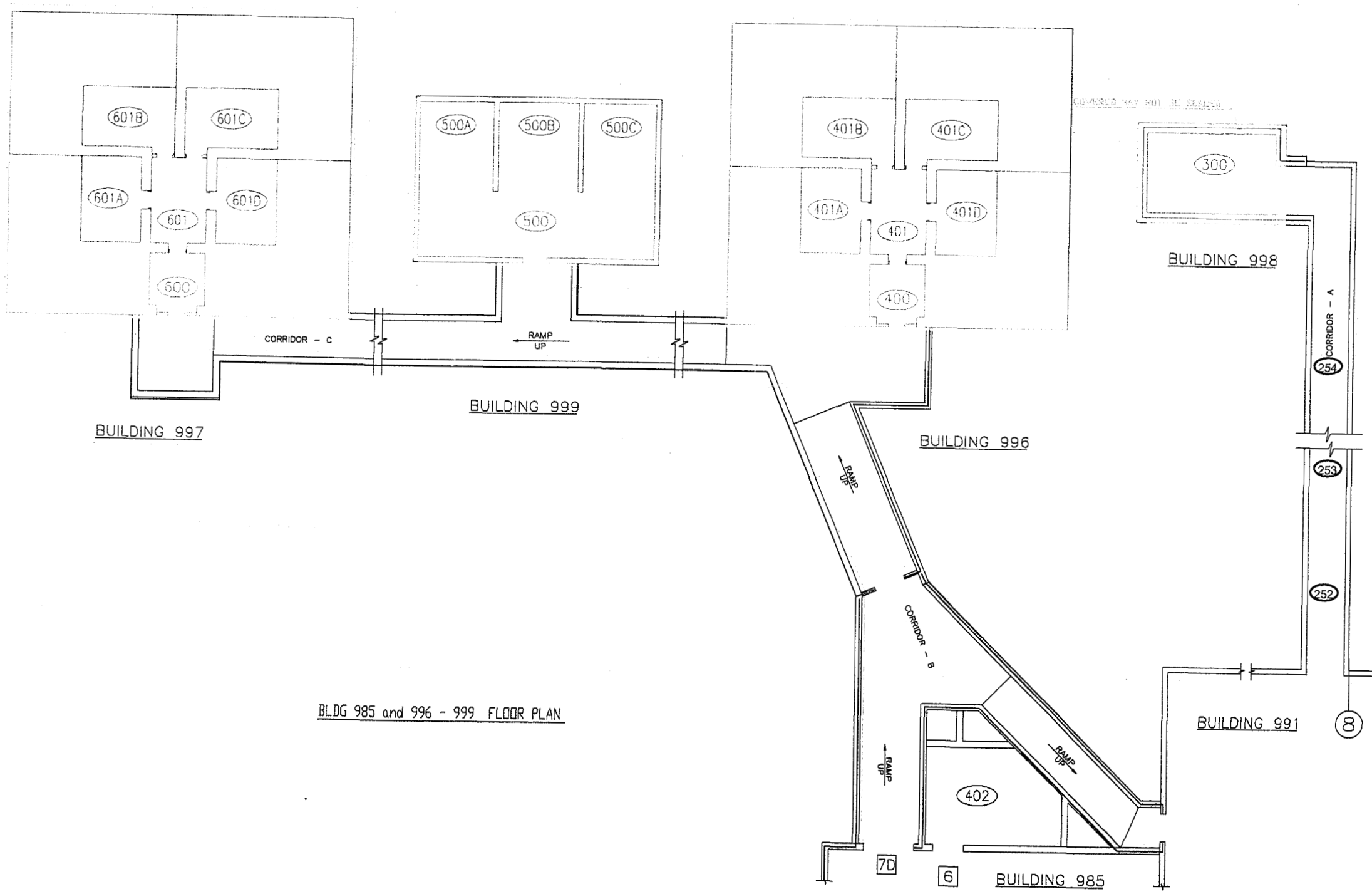
KAISER-HILL

MAP ID: 02-0355/991-INACC-2 September 16, 2002

199

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Tunnel



BLDG 985 and 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

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Rocky Flats Environmental Technology Site

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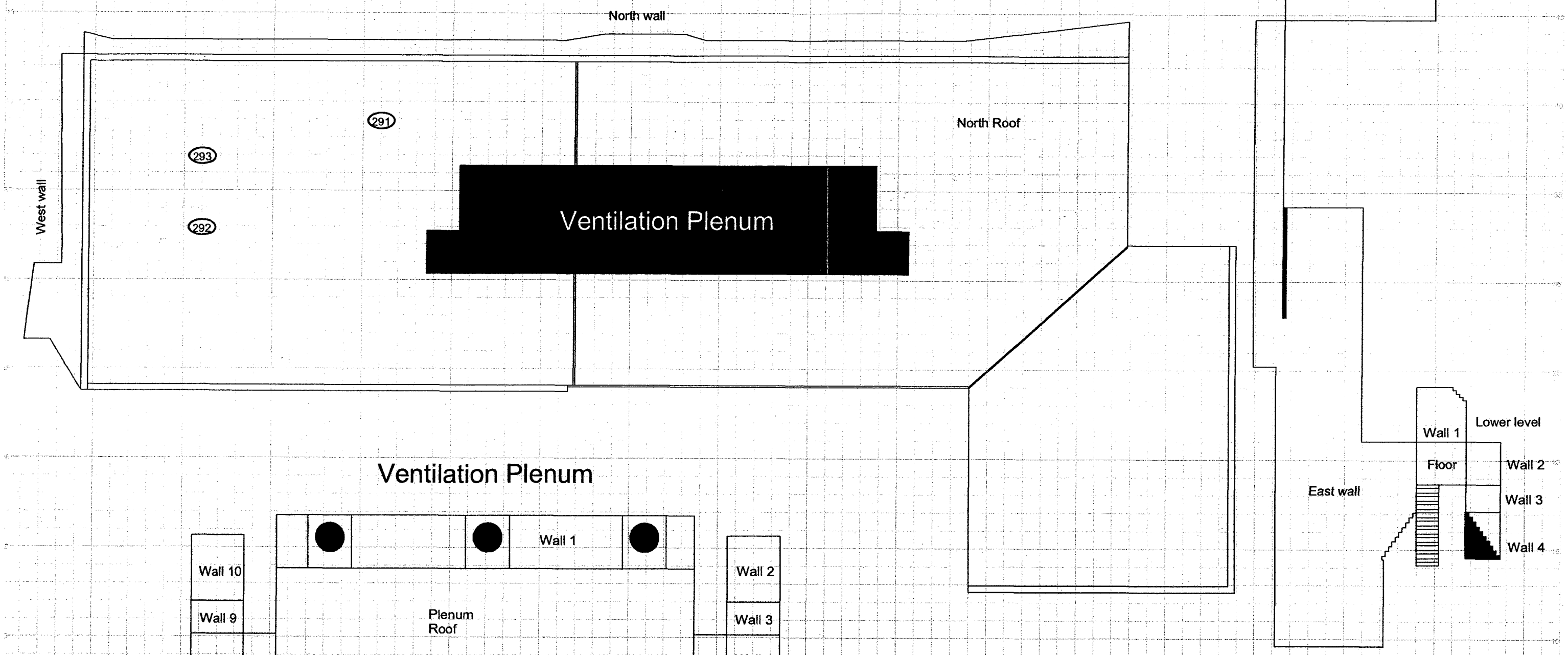
KAISER HILL COMPANY

MAP ID: 02-0355/991TUNNEL-ASB September 4, 2002

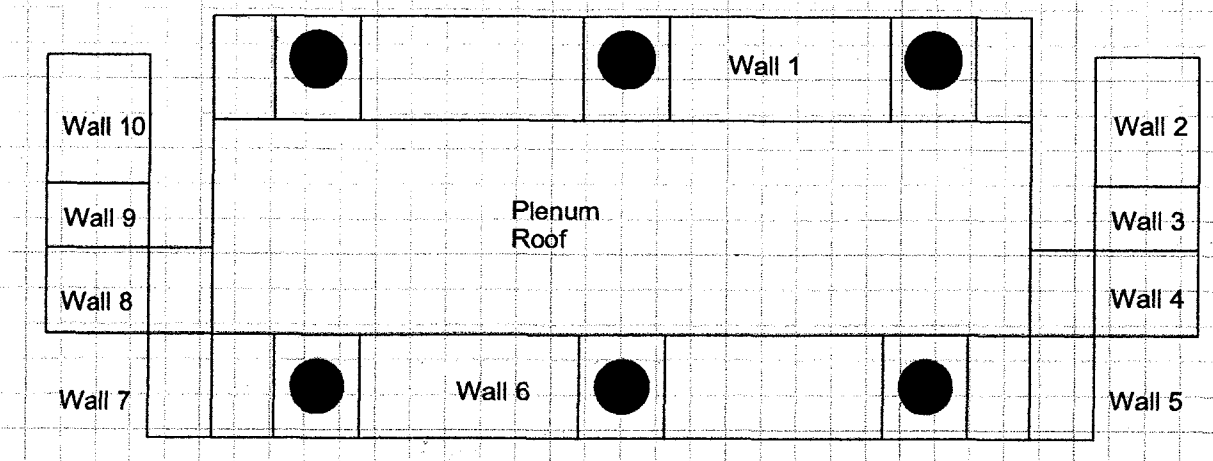
208

CHEMICAL SAMPLE MAP

Building: 991 Roof



Ventilation Plenum



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 25

0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
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Prepared for: KAISER HILL

MAP ID: 02-0355/991-EX-ASB

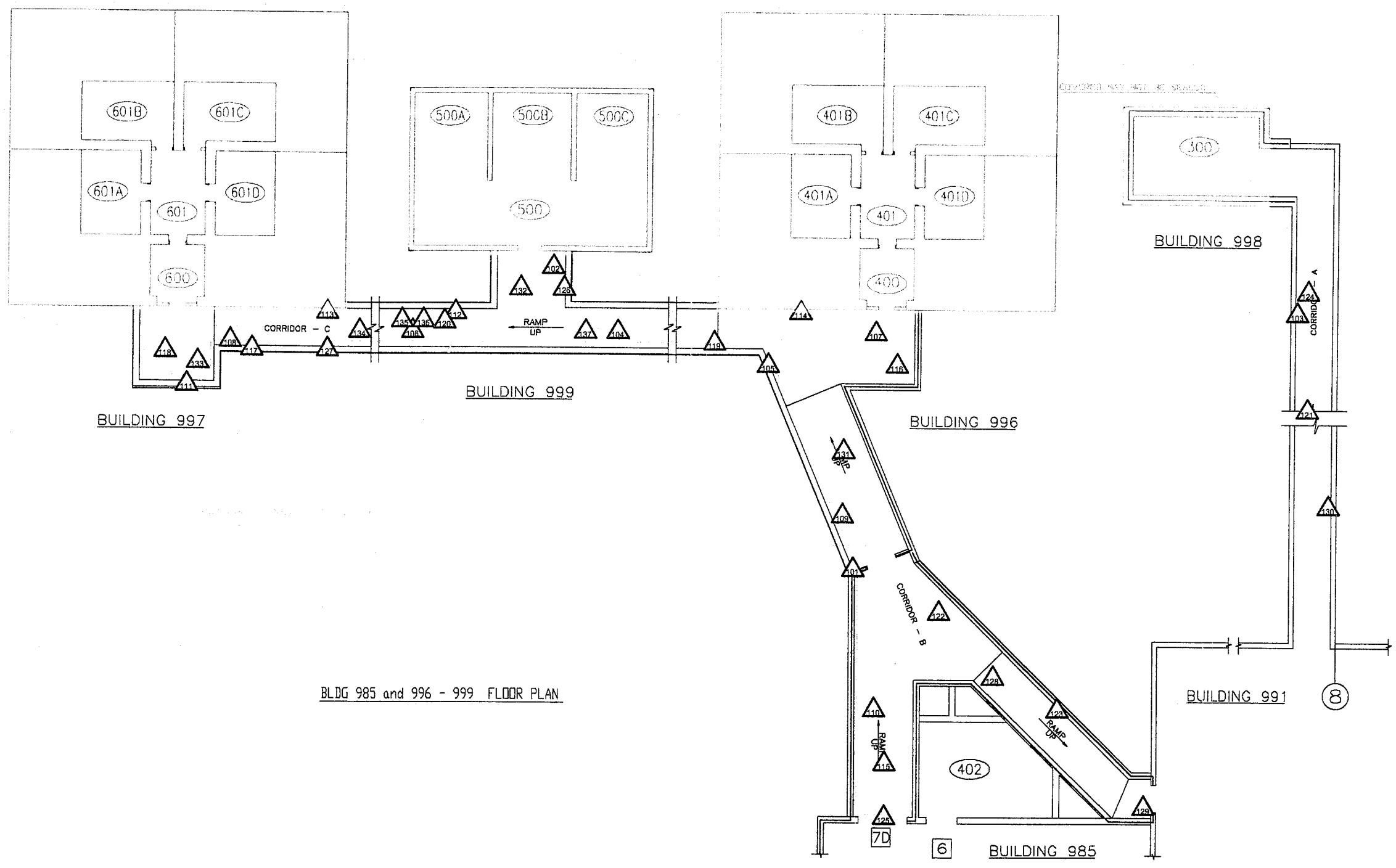
April 17, 2002

209

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Tunnel

BLDG 985 and 996 - 999 FLOOR PLAN



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

DynCorp
THE ART OF TECHNOLOGY

Prepared for: KAISER HILL

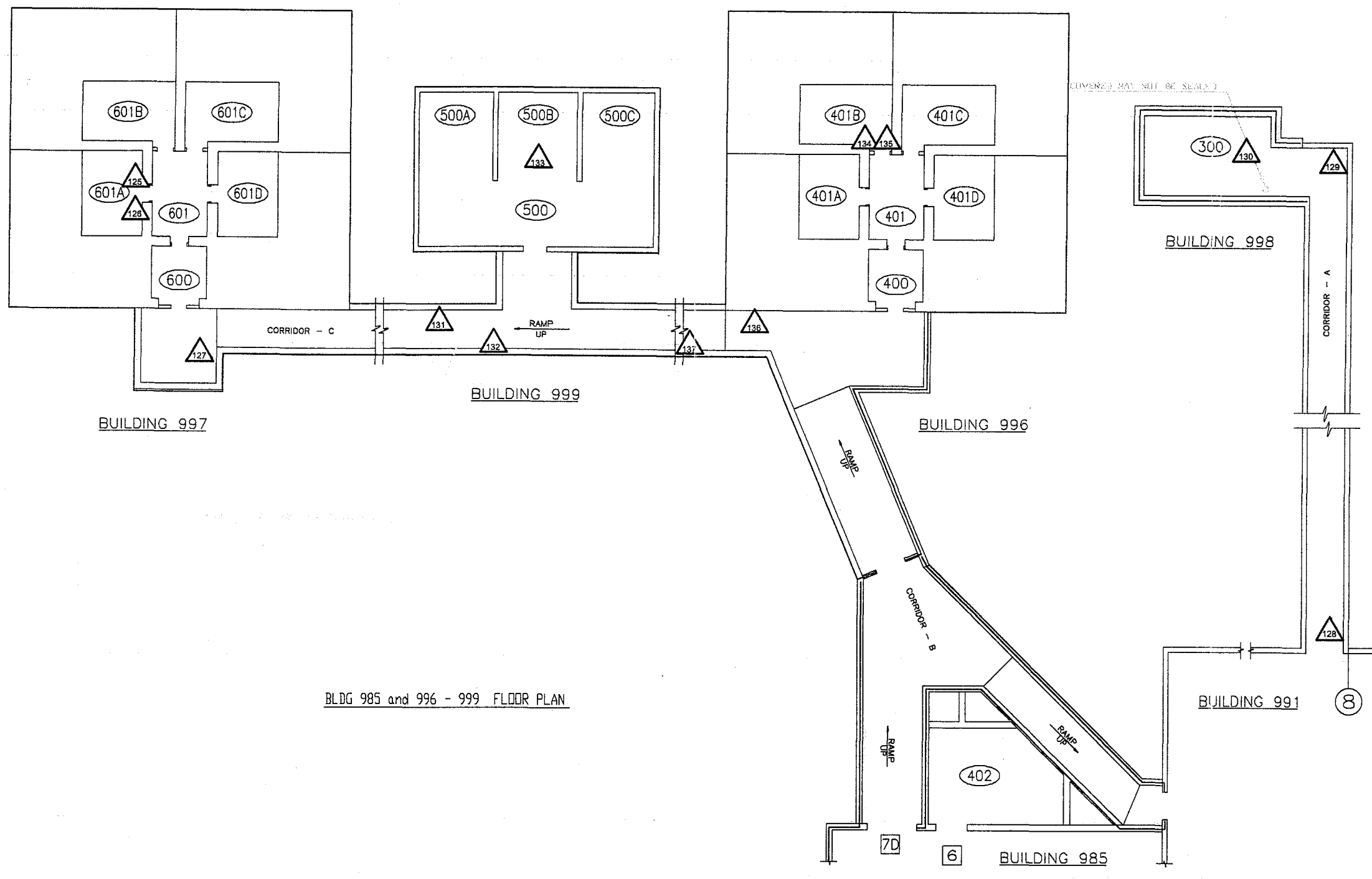
MAP ID: 02-0355/991TUNNEL-BE

September 4, 2002

219

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Tunnel
Plenum Access



BLDG 985 and 996 - 999 FLOOR PLAN

222

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

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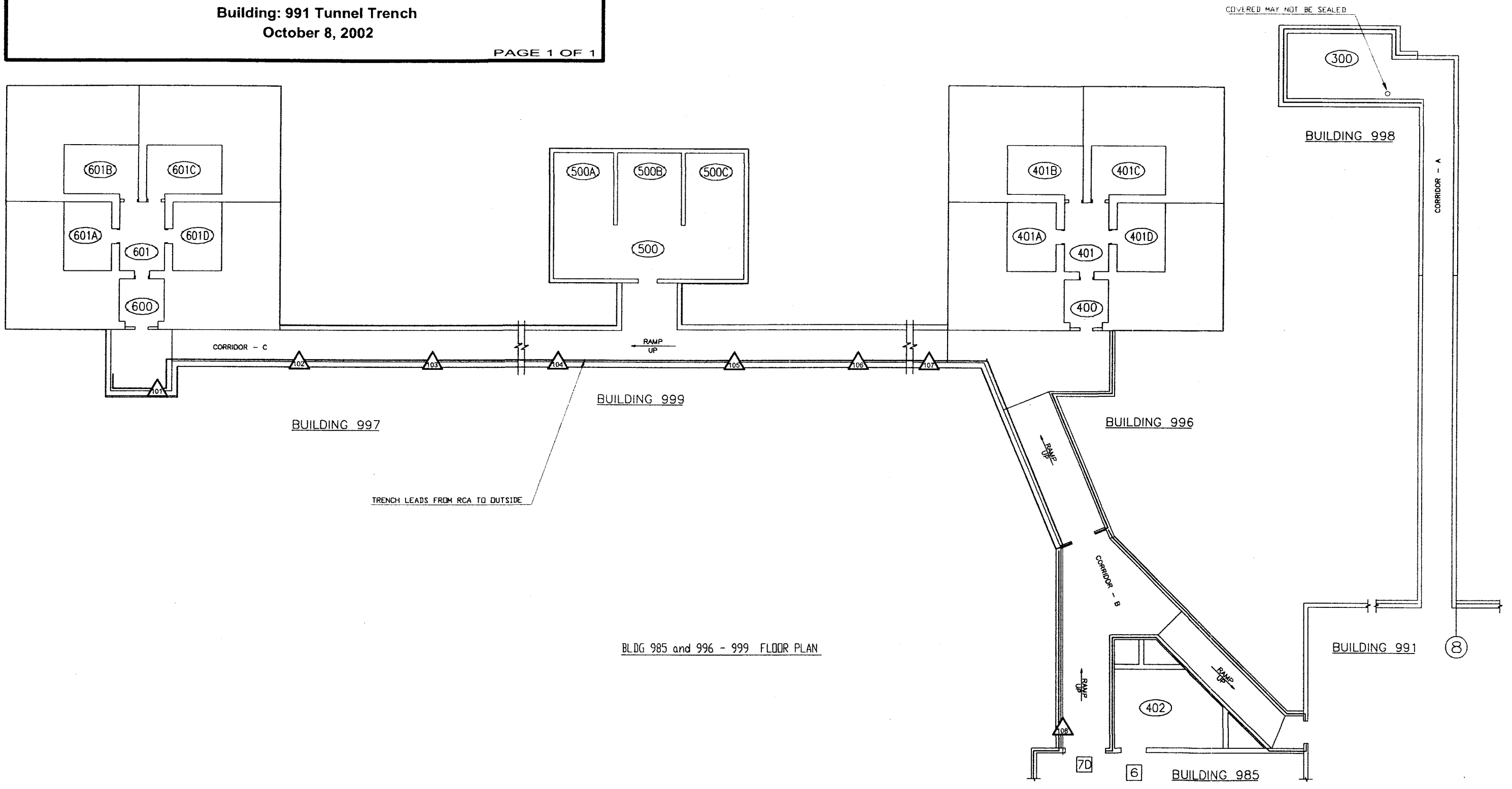
THE ART OF TECHNOLOGY

Prepared for:
KAISER HILL

MAP ID: 02-0355/991-Plenum September 4, 2002

CHEMICAL SAMPLE MAP FOR 991 CLUSTER

Building: 991 Tunnel Trench
October 8, 2002



BLDG 985 and 996 - 999 FLOOR PLAN

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 0

0 METERS 0

DRAWING NOT TO SCALE

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

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MAP ID: 02-0355/991TUN-BE2

Oct 8, 2002